

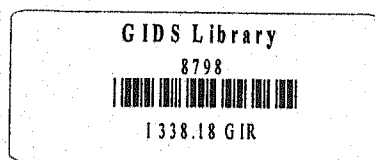
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BENCH MARK STUDIES OF SOCIO-ECONOMIC
CONDITIONS OF THE DROUGHT PRONE
AREAS OF UTTAR PRADESH
AND
RAJASTHAN

(Sponsored by the Central Water Commission, New Delhi) .

DISTRICT PROFILE : CHURU

A. JOSHI
G. S. MEHTA
P. S. GARIA



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B-42 NIRALA NAGAR LUCKNOW 226007
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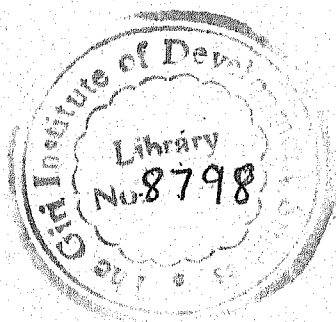
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P R E F A C E

This report has been prepared as a part of the research project "Bench Mark Studies of Socio-economic Conditions of Drought Prone Areas of Uttar Pradesh and Rajasthan", sponsored by the Central Water Commission, New Delhi. It aims at portraying the resource potential and economic structure of Churu district with a view to identifying the major constraints and exploring possibilities of further development. Special stress has been laid on the potential and utilisation of water resources for the purpose of socio-economic development of the district. An attempt has been made towards the end of the report, to suggest major possible directions for a strategy for development of the district.

The profile has been prepared with the overall direction and guidance of Dr. T.S. Papola, Dr. G.P. Misra and Dr. R.T. Tewari, the project directors. Dr. T.S. Papola also went through the earlier drafts and suggested improvements for the finalisation of the report. The team of colleagues who undertook the task of collection of data used in this report consisted to Shri B.K. Bajpai, Shri Fahimuddin, Shri D.K. Bajpai, Shri Yaminul Hasan, Shri C.S. Adhikari, Shri Dinesh Singh and Shri P.K. Tripathi. Our grateful thanks are also due to the district officials, specially of the Directorate of Economics and Statistics, Jaipur, for providing necessary cooperation and access to the statistical data relating to the district. We are also thankful to Shri N.B. Bhatt, who handled the typing work very efficiently.

Lucknow

November, 1983

A. Joshi

G.S. Mehta

P.S. Garia

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CHAPTER I

Physical Features

The district derives its name from the town of Churu which was founded 1620 A.D. Before the creation of the state a part of the district came under the earstwhile princely state of Bikaner. The district got its present shape in 1948. However, some changes were also made in 1959 in the area and distribution of tehsils with the transferring of villages from one tehsil to another. At present the district has seven tehsils and covers a total area of 16830 sq.kms. thereby making it the eighth largest district of Rajasthan.

Churu is situated between $27^{\circ}4'$ to $29^{\circ}00'$ latitude and $73^{\circ}40'$ and $75^{\circ}41'$ longitude of the middle portion of north-east Rajasthan and comprises of eleven towns and 904 villages of which 54 villages are uninhabited. Most areas are desertful and are covered with a thick mantle of sand either partly or fully. Sand dunes ranging from 6 meters to 30 meters in height are another characteristic of the district of which the highest are situated in the north-west. Some hillocks are also found in the Western and Eastern parts whose average height is around 400 meters above sea level.

The district is bounded on the north by Ganganagar district, on the west by Bikaner district on the south by Nagaur and on the east by Sikar and Jhunjhunu districts of Rajasthan and partly by Hissar district of Maryana.

Climate

The district is a semi desert region with dry desert type climate with large variations in temperature and scanty rainfall. The period from July to September is the period of the south-west monsoon. The period from mid September to October is the period of transition from the monsoon to winter while November to March is the winter season and April to June are the summer months.

Temperatures start rising from March and reach a peak by June when the mean daily temperatures touch a maximum of 41.3°C and minimum of 29°C . On the other hand January is the coldest month with the maximum mean daily temperature being 22.1°C and the minimum temperature 4.8°C .

The district receives rainfall from the south-west monsoons. It receives highest rainfall between June and September accounting for over 85 per cent of the total annual rainfall. The average annual rainfall of the district is 339.4 mm. Rainfall in the post monsoon period is only around 13.3 per cent which is received between October and November and January to May.

Churu is a district with rather low humidity. Only during the monsoon period does the humidity exceed 60 per cent while in the summers it goes below 30 per cent.

Soil and Soil Erosion

The district has had no detailed soil surveys undertaken so far. One survey was conducted by the settlement officers but this was done with the limited objective of classifying the soils as Barani (un-irrigated) and Chahi (irrigated).

Churu has predominantly sandy soil accounting for as much as 90-95 per cent sand while the rest is clay. The district is covered by sand dunes which are not fit for agriculture and no vegetation can be grown on them. Hard and level fields are generally scattered over the district and are concentrated particularly in the tehsils of Rajgarh and Sujangarh. Cultivation of Barley is common and wheat is grown with the help of irrigation. Sandy soil is found in Dungargarh tehsil and Bajra can be cultivated there since it does not require heavy rainfall.

Saline soils containing sodium and magnesium in high proportions are found in Rajgarh and Churu tehsils and partly in Sardarshahar. In areas that are relatively less alkaline Bajra Guwar and Moth is cultivated.

In the sandy areas soil erosion creates many problems for agriculture as strong winds take away the layers of fertile soil with them. During the summer season north-west winds transfer sand from one place to another. The Central Government appointed a committee to look into the problem of

Table 1.0

Land Use Pattern in 1977-71, 1978-79 and 1979-80

		(Area in Hectares)		
Sl. No.	Land Use Particulars	1970 - 71	1978 - 79	1979 - 80
1.	Geographical Area	1686038 (100.00)	1686200 (100.00)	1686200 (100.00)
2.	Forest	1930 (0.11)	5946 (0.35)	5890 (0.35)
3.	Barrent & Cultivable Land	864 (0.05)	858 (0.05)	856 (0.05)
4.	Land put on Non-agriculture Use	72728 (4.31)	71109 (4.22)	71476 (4.24)
5.	Cultivable Waste	73285 (4.35)	43740 (2.59)	64130 (3.80)
6.	Permanent & Other Grazing Land	45086 (2.67)	47350 (2.80)	47522 (2.82)
7.	Current Fallow	111115 (6.59)	137450 (8.15)	426747 (25.31)
8.	Other Fallow	148356 (8.80)	128469 (7.62)	194428 (11.53)
9.	Net Area Sown	1232674 (73.11)	1251278 (74.20)	875151 (51.90)
10.	Net Irrigated Area	230 (0.02)	N.A.	247 (0.08)
11.	Double Cropped Area	10299	21505	4535
12.	Gross Irrigated Area	1242973	1272783	879686
13.	Gross Cropped Area	392 (0.03)	N.A.	790 (0.09)

N.B. : Percentages in brackets are percentages to total geographical area and net area sown.

Source: District Statistical Hand Book Churu, Directorate of Economics and Statistics, Jaipur, Rajasthan.

soil erosion in 1952. In 1954 an organisation named "Desert Afforestation and soil Conservation Research Station" was formed for this purpose and is still functioning and doing useful work for stabilisation of shifting sand dunes.

Land Use Pattern

Land use pattern in Churu is being observed at two points of time : 1970-71 and 1979-80. The data for 1970-71 reveal the fact that net cultivable area accounts for almost three-fourths of the total geographical area in Churu. Another 15 per cent approximately was under current or other fallows. Fallows form a significant proportion of the total area since in Churu after growing one crop the land is generally left fallow such that its fertility is retained. The proportion of land under cultivation and as fallow keeps fluctuating with the extent of rainfall. Churu being a district with a negligible level of irrigation, rainfall plays a significant role. This is reflected in the very high area under cultivation (73 per cent) in 1970-71. On the contrary 1979-80 was a year of severe drought and the percentage of net area sown came down to around 52 per cent only where as current fallows increased from around 6.5 per cent to slightly over one-fourth. Other fallows also went up and the two categories either accounted for nearly 37 per cent of the total area in 1979-80. These drastic fluctuations in the land put to agricultural use obviously affect the level of production, income

of the district and in turn the levels of living of the rural masses whose main source of livelihood is agriculture. In the absence of proper irrigation facilities and keeping in mind the fact that not much headway can be made in respect of advancing irrigation facilities in the near future at least, nature is going to play a decisive role in determining the levels of agricultural production since cultivators are bound to depend rather heavily on rainfall.

As can be expected of a desert area, forests cover an insignificant proportion of the total reporting area of the district. The 1979-80 statistics show a meagre 0.35 per cent of the total area under forests. In 1970-71, however, this percentage was only 0.11. The entire area (5890 hectares) under forests is administered by the forest department. Many steps have been taken for the development of forests in Churu but the results have been unsatisfactory. The forest products are mostly used for fuel purposes except for Shisham which is used for manufacturing of furniture and for building purposes.

Even from the geological point of view the district is not rich in minerals. Although some minerals do exist they are found scattered over small pockets and are not rich enough to be exploited on a commercial basis. Investigation work is being carried out in the case of copper which is found in Ratangarh tehsil. Similarly some gypsum is found in Taranagar tehsil and is also under investigation currently.

Very small deposits are also found of magnesium lime stone and it is extracted by the local people while the government collects some royalty against its sale. On the whole, therefore, minerals and their mining on a commercial level do not seem to hold much promise in the district.

It will be worthwhile to look into the water resources of the district since exploitation of its potential would mean a betterment in the agricultural situation of the district. The district has no perennial rivers and thus ground water is the single important source for irrigation in Churu. The total ground water resources of the area have been estimated by the State Ground Water Board, Rajasthan (1972-73), the Central Ground Water Board (1980) and by the Special Schemes Organisation (1982), and, although they have arrived at slightly different figures for a recharge, draft and surplus of the ground water reserves. However, the estimates of the three agencies clearly bring out the fact that the district has a reasonable ground water potential most of which is not yet utilised. The increased level of irrigation by its utilisation will go a long way in improving the per hectare productivity of the crops.

There are no firm estimates pertaining to surface water potential in the district. The district has sandy soil, high rate of evaporation, erratic rainfall and no rivers, thus whenever be the level of rainfall the water is lost to

either evaporation or absorption by the soil which is porous. Based on a 50 per cent run off worked out by the water balance method, the Central Water Commission arrived at a figure of 57.1 M.C.M.

Livestock

Churu ranks eleventh with respect to livestock population in Rajasthan. Sandy soil and abundance of sand dunes restricts area under pastures which is around 2.8 per cent of the total area. The poor availability of gross and fodder and the limited pastures leave obviously pose severe constraints on livestock development. The livestock population was 14.29 lakhs and 15.79 lakhs as given by the livestock Census of 1971 and 1977. Goats and sheep which are known to be able to survive under adverse conditions constitute the bulk of livestock population and accounted for 34.27 and 29.53 per cent respectively in 1971 and, 38.27 and 29.02 per cent in 1977. As compared to 1971 the goat population registered an increase of 9 per cent while that of sheep by 23 per cent in 1977. The State Government has laid special emphasis on sheep and goat rearing centres and has also developed better breeds under the rural development programmes. The wool obtained from goats and sheep is being consumed locally for the production of woollen products. Some quantity of the wool is also sold outside the district in the case of a surplus. Cattle and buffaloes accounted

Table 1.1

Distribution of Livestocks and Poultry in 1971 & 1977

Sl. No.	Category of Livestock and Poultry	Numbers in 1971	% to total Livestock	Numbers in 1977	% to total Livestock
1.	Cattles (Total)	285602	20.64	273284	17.36
	Male	(100.00)		(100.00)	
	More than 3 years	9911		7231	
		(3.47)		(2.65)	
	Female more than 3 years	143000		138544	
		(50.07)		(50.60)	
	Male & Female less than 3 years	133691		127509	
		(46.46)		(46.65)	
2.	Buffaloes (Total)	133268	9.35	140462	8.92
		(100.00)		(100.00)	
	Male more than 3 years	3863		4599	
		(2.90)		(3.27)	
	Female more than 3 years	68837		71241	
		(51.65)		(50.72)	
	Males & Females less than 3 years	60568		64622	
		(45.45)		(46.01)	
3.	Sheeps	420852	29.53	456952	29.02
4.	Goats	488413	34.27	602643	38.27
5.	Horses and Ponies	510	0.04	326	0.02
6.	Mules and Donkeys	2092	0.15	4595	0.29
7.	Camels	94578	6.64	96063	6.10
8.	Pigs	70	Neg.	197	0.01
<hr/>					
Total No. of Livestocks		1425385	100.00	1574522	100.00
Poultry		2903		4414	
Total Livestocks and Poultry		1429278		1578936	

Source : Livestock Census; 1971 and 1977 of Rajasthan.

for 20.04 and 9.35 per cent respectively of the total livestock population in 1971. There was a slight decline in them by 1977 to 17.36 and 8.92 per cent respectively. In the case of milch cattle even their absolute number went down from 2.86 lakhs to 2.73 lakhs between 1971 and 1977. However, there was an increase in the absolute number of buffaloes from 1.33 lakhs to 1.40 lakhs during the same period. Around 50 per cent of the cattle and buffaloes population of the district constituted of females above 3 years in both the Census years.

Camels, as can be expected, constituted a sizeable number and accounted for around 6 per cent of the livestock population in each of the two years.

CHAPTER II

Human Resources

Demographic Structure

According to the provisional Census figures, Churu has a total population of 11.76 lakhs in 1981 which is 3.45 per cent of the population of Rajasthan State. The population of the district has grown at an annual rate of 3.45 per cent during 1971-81 as against growth of 3.24 per cent per annum in the case of the State. The rural-urban composition of population of the district has remained between 1971 and 1981, rural population was 70.42 per cent in 1971 and 70.69 per cent in 1981. Rural population has grown at 3.5 per cent annually while its urban counterpart has grown at 3.3 per cent. Within the rural population the male-female composition has shifted slightly in favour of females whose share in total rural population has increased from 48.33 per cent (1971) to 48.98 per cent (1981). A reverse trend is observed in the urban population where male population constitutes a higher proportion in 1981 (51.26 per cent) as compared to 1971 (50.68 per cent). Considering total male female population it is observed that the overall female population has had a decadal growth of 35.30 per cent as compared to 33.71 per cent in the case of males.

A review of the population growth during various Census years starting from 1901 to 1981 shows that population growth

to decade rate has accelerated from decade/except in the 1911-21 and 1941-51 decades. During 1911-21 the population decreased by 0.09 per cent and during 1941-51 the population increased in smaller proportion as compared to any other decade. The district was affected by natural calamities like malaria, famine and epidemics in the former decade and by famines causing widespread havoc in the district during 1941-51.

Table 2.0

Distribution of Population in 1971 and 1981

Classification	1971		1981		Variations
	Numbers	% Total Population	Number	% Total Population	
Rural Population (Male)	318203	36.39	424211	36.07	+34.40
Rural Population (Female)	297608	34.03	407232	34.62	+36.84
Total Rural Population	615811	70.42	831443	70.69	+35.02
Urban Male	131076	14.99	176710	15.02	+34.81
Urban Female	127552	14.59	168017	14.29	+31.72
Total Urban Population	258628	29.58	344727	29.31	+33.29
Total Population of the District	874439	100.00	1176170	100.00	+34.51

Source : Census of India, Rajasthan 1971 & 1981 (Provisional).

The Census years of 1971 and 1981 have registered the highest growth rate in population.

Table 2.1

Growth of Population 1901-81

Sl. No.	Year	Population	+ Variations
1.	1901	260186	
2.	1911	299349	+15.05
3.	1921	399067	- 0.09
4.	1931	265629	+22.26
5.	1941	455446	+24.56
6.	1951	523650	+14.98
7.	1961	659011	+25.85
8.	1971	874439	+32.69
9.	1981	1176170	+34.51

Source : Census of India of Corresponding Years.

Density of Population

Density of population has increased in accordance with the increasing trend of population. It seems that the district is having a very small urban area where the density of population is found quite high (1151). Population density of the rural areas of the district was as low as 37 person per sq. km. in 1971. The overall density of population was 52 in 1971 and 70 per sq. km. in 1981. Thus Churu is a relatively sparsely populated district.

Table 2.2

Density of Population in 1971 and 1981

Sl. No.	Classification	(in per sq. km.)	
		1971	1981
1.	Rural	37	N.A.
2.	Urban	1151	N.A.
	Total	52	70

Source : Census of India, Rajasthan 1971, 1981 (Provisional)

Sex Ratio

According to 1981 Census, the number of females per 1000 males was 960 and 951 in rural and urban areas respectively while in 1971 Census year, the corresponding figure was lower in rural areas (935) and higher in the urban areas (973). At the same time, in the district as a whole the ratio has increased from 946 in 1971 to 957 in 1981.

Table 3.3

Sex-Ratio in 1971 and 1981

Sl. No.	Classification	1971	1981	± Variations
1.	Rural	935	960	+ 2.67
2.	Urban	973	951	- 2.26
	Total	946	957	+ 1.16

Source : Census of India, Rajasthan 1971 & 1981 (Provisional)

This is conforming to the general pattern of male female population growth observed in the rural and urban areas between 1971 and 1981 which shows that in the rural areas females have grown at a faster rate whereas it is the males which have recorded a higher rate of growth in the urban areas. Another reason for the decline in sex ratio of the urban areas could possibly be the result of a migratory trend in male population from the rural to urban areas in search of employment opportunities.

Literacy

Churu, is a backward district from the point of view of literacy which is particularly low in the rural areas. The overall literacy in the district was 18.95 per cent in 1971 to which there has been some improvement by 1981 (21.62 per cent). Literacy in rural areas was only 14.34 per cent while in the urban areas it was 39.16 per cent. The literacy rates obtained in the district in 1981 were lower than the rate in the State as a whole (24.05 per cent). The State was better off in both rural and urban literacy rates as compared to the district. However, it may be pointed out that the state as a whole has a literacy level below the all India average (36.17 per cent) and is bracketed alongwith the less literate states in the country. There has been improvement in the level of literacy in the district in 1981 over 1971 both in its rural and urban components

Table 2.4

Literacy Rates in 1971 and 1981

Sl. No.	Classification	District				State 1981
		1971	1981			
			M	F	T	
1.	Rural	12.08	24.92	3.32	14.34	17.73
2.	Urban	35.53	52.39	25.25	39.16	46.92
	Total	18.95		9.73	21.62	24.05

Source : Census of India, Rajasthan 1971 and 1981 (Provisional)

but it is the female literacy which is a major cause of concern particularly in the rural areas where only 3.32 per cent of female population is literate. In the urban areas, however, female literacy percentage is 25.25 and in the district as a whole the female literacy rate is 9.73 per cent.

Schedule Caste and Schedule Tribe

According to the Census of 1981 (provisional) the schedule caste population is 230534 and the population of schedule tribe is 5619. The schedule caste population accounts for 19.60 per cent while the schedule tribes constitute 0.48 per cent to the total population of the district. The ratio of these backward classes has increased over the last decade. The population of these castes was 17.36 per cent and 0.39 per cent respectively in 1971, which shows that the population of these castes is

increasing much faster than rest of the population. The population of schedule tribe and schedule caste has increased at the rate of 51.84 per cent and 64.64 per cent respectively in 1981 over the period of 1971 while the district population taken together had a growth of 34.51 per cent during same period.

Table 2.5

Schedule Caste and Schedule Tribe Population in 1971 and 1981

Caste	1971		1981		Variation (+)(-)
	Popula- tion	% to total Population	Popula- tion	% to total Population	
Schedule Caste	151825	17.36	230534	19.60	+ 51.84
Schedule Tribe	3413	0.39	5619	0.48	+ 64.64
Total	874439		1176170		+34.51

Source : Census of India, Rajasthan 1971 & 1981 (Provisional)

Worker-Population Ratio

is
In Churu 29.56 per cent person/out of total population constitutes the total work force which is engaged in different activities in 1981. In 1971 this percentage was 30.12. The slight decline in the worker population ratio can be attributed to a rapid increase in population growth whereas the corresponding job opportunities have not increased proportionately. There has been an overall increase of 32.00 per cent in the workforce in 1981 over 1971.

The workforce population ratio has decreased in the Dungargarh, Sadarshahr, Churu and Ratangarh tehsils while it has increased in Taranagar, Rajgarh and Sujangarh tehsils at marginal proportion. The marginal decrease in the percentage workforce in the district indicates a slight deterioration in the dependancy ratio.

A higher worker population ratio is recorded in the tehsil Taranagar (35.13 per cent) and lowest ratio of 26.22 percentage in tehsil Churu in 1981. The ratio of tehsil Dungargarh has decreased from 34.49 per cent to 32.93 per cent while in Rajgarh there has been an increase from 26.43 per cent to 27.07 per cent in 1981.

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During the decade 1971 - 1981 the highest growth in workforce of 43.70 per cent has been recorded in the tehsil Taranagar. The growth of population is far below the growth of workforce in the same tehsil. On the other hand, the growth of workforce is far less than the growth of population in the tehsil of Dungargarh during the period 1981 as compared to 1971.

As per 1981 Census, there are 83.83 per cent male workers and 16.17 per cent female workers in the district. The highest percentage of male workers participation has been found in the tehsil Churu (91.64 per cent) and the lowest percentage of 74.60 per cent in the tehsil Taranagar. Similarly in 1971, there were 83.87, per cent male workers and 16.13 per cent female

Table 2.6

Tehsil-wise Worker's Distribution

Tehsil/ District	1971		1981	
	Total Population	Total Workers	Total Population	Total Workers
Dungargarh	92290 (100.00)	33678 (36.49)	124574 (100.00)	41019 (32.93)
Taranagar	79876 (100.00)	26673 (33.39)	109101 (100.00)	38328 (35.13)
Sardarshahr	129476 (100.00)	41671 (32.18)	190294 (100.00)	56988 (29.95)
Churu	129486 (100.00)	36382 (28.10)	163375 (100.00)	42832 (26.22)
Rajgarh	155546 (100.00)	41116 (26.43)	205314 (100.00)	55578 (27.07)
Ratangarh	114472 (100.00)	33025 (28.85)	152446 (100.00)	42148 (27.65)
Sajangarh	173293 (100.00)	50867 (29.36)	231066 (100.00)	70792 (30.63)
Churu	874439 (100.00)	263412 (30.12)	1176170 (100.00)	347685 (29.56)

Source : Census of India, Rajasthan, 1971 & 1981 (Provisional)

workers engaged in the different activities in the district as a whole. The lowest number of female workers were in the Rajgarh tehsil in 1971 while the highest participation of females was in the tehsil of Dungargarh (28.05 per cent).

Viewing the composition of the workforce on a rural/urban basis it is observed that in the district as a whole slightly over three-fourths of the workforce (76.04 per cent) is from the rural segment whereas the urban segment comprises of less than one fourth (23.96 per cent). On the tehsil level Churu and Ratangarh are prominent as their urban composition of workforce is higher than the district average with 40.81 and 33.56 per cent respectively. On the other extreme we have Taranagar and Rajgarh tehsils where urban workforce is much lower at around 10 and 13 per cent respectively.

Occupational Distribution of Workers

Looking at the overall sectoral distribution of the workforce we find that in the district as a whole there has been a decrease in the percentage of both cultivators and agricultural labours in 1981 as compared to 1971. There has been only a marginal increase in the case of workers engaged in household industry. It is the category of workers which has been classified as 'other workers' which has attracted the bulk of workers displaced from agriculture. This is seen in the fact that the percentage of other workers went up from 16.83 per cent in 1971 to 21.10 per cent in 1981. In both the Census years however nearly three-fourths of the total workers have

been cultivators in the district. A similar pattern is seen at the tehsil level with the exception of Churu tehsil where only 65.80 per cent of the total workers were cultivators. By 1981 this percentage had come down to 56.96. Taranagar is the tehsil where the proportion of cultivators has increased from 79.11 per cent in 1971 to 88.20 per cent in 1981. As can be expected Churu had the highest proportion of other workers at both points of time followed by Ratangarh and Sujangarh.

Of the total rural workers in 1981, 89.5 per cent were engaged as cultivators while another 2.5 per cent were agricultural labourers. Agriculture alone, therefore, accounted for 92 per cent of the total workers. Cultivators and agricultural labourers, on the other hand, constitute slightly over one-fourth of the urban workers. The rest being workers in the household type industries and the other categories of workers. The tehsils follow the general pattern in the occupational structure of the rural workforce as obtained at the district level. However, when we see the occupational pattern among the urban workers it is observed that Churu and Sardarshahr both have low percentage of cultivators (around 11 per cent each) as compared to the district average (21.46 per cent). This shortfall is compensated by a higher proportion of the workers in the category of 'other workers' whose percentage in the two tehsils is around 73 as against the district average of 66. Taranagar, on the other hand, has a relatively very high percentage (48.28 per cent) of urban workers in the category of cultivators.

Analysing the sectoral distribution of workers in various tehsils, that a very high percentage of workers are engaged in the agriculture and allied agricultural activities. It is also found that in the district the proportion of male workers has decreased while the proportion of female workers has increased slightly in the agricultural sector in 1981 over the year 1971. The trend has been the opposite in the case of two tehsils, namely, Dungargarh and Sardarshahr during the same period. At the district level, the percentage of both male and female workers working in the agricultural sector as wage earners (agricultural labourers) decreased marginally. In the tehsil of Sardarshahr and Churu however the participation of both the category of workers has increased. In the household manufacturing sector which engages a very small proportion of labour force, the ratio of male workers has increased from 2.08 per cent to 2.19 per cent while the ratio of female has decreased from 0.25 per cent to 0.22 per cent in 1981 as compared to 1971. At the same time, the proportion of male workers has decreased in the tehsil of Taranagar and Churu while the proportion of female workers is constant in the tehsil Dungargarh and that of male workers in tehsil Ratangarh. In the case of other workers (non-households manufacturing and non-commodity producing sectors) engages a higher proportion of workforce than the other sectors in the district where the male workforce has increased considerably while female workforce has decreased very slightly in 1981. In the tehsil of Taranagar the ratio of both male and female workers has decreased.

Table 2.7 : Occupational Distribution of Workers by Sex in Different Tehsil in 1971 and 1981

Tehsils	Household											
	Cultivators				Agricultural Labourers		Industry and Processing		Other Workers		Total Workers	
	Male	Female	3	4	5	6	7	8	Male	Female	Male	Female
1	2								9	10	11	12
Dungargarh	19295 (57.29)	8831 (26.22)		1125 (3.34)	394 (1.17)	373 (1.11)	51 (0.15)	3440 (10.21)	169 (0.50)	24233 (71.95)	9445 (28.05)	33678 (100.00)
Taranagar	18177 (68.14)	2909 (10.91)		1297 (4.86)	798 (2.99)	375 (1.42)	137 (0.51)	2454 (9.20)	526 (1.97)	22303 (83.62)	4370 (16.38)	26673 (100.00)
Sardarshahr	24913 (59.78)	8057 (19.33)		920 (2.21)	196 (0.47)	605 (1.45)	69 (0.17)	6467 (15.52)	444 (1.07)	32905 (78.96)	8766 (21.04)	41671 (100.00)
Churu	19153 (52.64)	4788 (13.16)		1027 (2.82)	142 (0.39)	1459 (4.01)	78 (0.21)	9415 (25.88)	320 (0.88)	31054 (85.36)	5328 (14.64)	36382 (100.00)
Rajgarh	32980 (80.21)	1625 (3.95)		1093 (2.66)	232 (0.56)	296 (0.72)	32 (0.08)	4610 (11.22)	248 (0.60)	38979 (94.80)	2137 (5.20)	41116 (100.00)
Ratangarh	19335 (58.55)	3820 (11.57)		1082 (3.28)	172 (0.52)	1123 (3.40)	89 (0.26)	6844 (20.72)	560 (1.70)	28384 (85.95)	4641 (14.05)	33025 (100.00)
Sujangarh	31312 (61.57)	6727 (13.22)		2172 (4.26)	394 (0.78)	1245 (2.45)	194 (0.38)	8346 (16.40)	477 (0.94)	43075 (84.68)	7792 (15.32)	50867 (100.00)
District Total	165165 (62.70)	36757 (13.95)		8716 (3.31)	2328 (0.88)	54676 (2.08)	650 (0.25)	41576 (15.78)	2644 (1.05)	220933 (83.87)	42479 (16.13)	263412 (100.00)

Continued.../-

Table 2.8 : Rural-Urban Distribution of Sectoral Workforce in 1981

Tehsils/ Sectors	Cultivators			Agricultural Labourers			Household Industries, Manufacturing, Servi- cing and Repairings			Mother workers			Total Workers		
	Rural		Total	Rural		Total	Rural		Total	Rural		Total	Rural		Total
	Urban	Rural		Urban	Rural		Urban	Rural		Urban	Rural		Urban	Rural	
Tara Nagar	1862 (92.68)	31946 (92.68)	33808 (88.21)	167 (.58)	546 (1.86)	713 (1.86)	156 (4.04)	302 (0.88)	458 (1.19)	1672 (43.35)	1677 (4.86)	3349 (8.74)	34471 (100.00)	3857 (100.00)	38328 (100.00)
Rajgarh	1976 (90.67)	43857 (90.67)	45833 (82.47)	468 (1.85)	897 (1.85)	1365 (2.46)	385 (5.34)	403 (0.83)	788 (1.42)	4379 (60.75)	3213 (6.65)	7592 (13.66)	48370 (100.00)	7208 (100.00)	55578 (100.00)
Sardar Shahr	1574 (91.13)	39403 (91.13)	40977 (71.90)	1285 (2.90)	1255 (2.90)	2540 (4.46)	941 (6.84)	195 (0.45)	1136 (1.99)	9951 (72.37)	2384 (5.51)	12335 (21.64)	43237 (100.00)	13751 (100.00)	56988 (100.00)
Churu	1921 (88.66)	22477 (88.66)	24398 (56.96)	1299 (3.27)	829 (3.27)	2128 (4.98)	1337 (7.65)	240 (0.95)	1577 (3.68)	12924 (73.93)	1805 (7.12)	14729 (34.39)	25351 (100.00)	17481 (100.00)	42832 (100.00)
Dungar garh	2096 (90.05)	30956 (90.05)	33052 (80.58)	296 (1.65)	569 (1.65)	865 (2.11)	474 (7.14)	235 (0.68)	709 (1.73)	3772 (56.82)	2621 (7.62)	6393 (15.59)	34391 (100.00)	6638 (100.00)	41019 (100.00)
Ratan garh	3442 (85.64)	23983 (85.64)	27425 (65.07)	594 (2.82)	789 (2.82)	1383 (3.28)	1237 (8.75)	402 (1.44)	1639 (3.89)	8873 (62.72)	2828 (10.10)	11701 (27.76)	28002 (100.00)	14146 (100.00)	42148 (100.00)
Sujan garh	5001 (87.28)	44149 (87.28)	49150 (69.43)	418 (3.77)	1909 (3.77)	2327 (3.29)	1487 (7.36)	582 (1.15)	2069 (2.92)	13302 (65.82)	3944 (7.80)	17246 (24.36)	50584 (100.00)	20208 (100.00)	70792 (100.00)
Dis- trict	17872 (89.56)	236771 (89.56)	254643 (73.21)	4527 (2.57)	6794 (2.57)	11321 (3.26)	6017 (7.22)	2359 (0.89)	8376 (2.41)	54873 (65.88)	18472 (6.98)	73345 (21.10)	264396 (100.00)	83289 (100.00)	347685 (100.00)

Source : Census of India, Rajasthan 1981 (Provisional).

N.B. Bracketed figures are percentages to total number of workers.

24 (a)

1	2	3	4	5	6	7	8	9	10	11	12
Dungargarh	24688 (60.19)	8364 (20.39)	764 (1.86)	100 (0.24)	646 (1.57)	63 (0.15)	6049 (14.75)	344 (0.85)	32148 (78.37)	8871 (21.63)	41019 (100.00)
Taranagar	24436 (63.75)	9372 (24.45)	554 (1.45)	159 (0.41)	418 (1.09)	40 (0.10)	3185 (8.32)	164 (0.43)	28593 (74.60)	9735 (35.40)	38328 (100.00)
Sardarshahr	34636 (60.78)	6341 (11.12)	2160 (3.79)	380 (0.67)	1053 (1.85)	83 (0.15)	11859 (20.80)	476 (0.84)	49708 (87.22)	7280 (12.78)	56988 (100.00)
Churu	21613 (50.46)	2785 (6.50)	1902 (4.44)	226 (0.53)	1493 (3.48)	85 (0.20)	14243 (33.25)	486 (1.14)	39250 (91.64)	3582 (8.36)	42832 (100.00)
Rajgarh	39001 (70.18)	6832 (12.29)	1225 (2.20)	140 (0.25)	731 (1.32)	57 (0.10)	7322 (13.17)	270 (0.49)	48279 (86.87)	7299 (13.13)	55578 (100.00)
Ratangarh	22869 (54.26)	4556 (10.81)	1212 (2.88)	171 (0.41)	1436 (3.40)	203 (0.48)	11131 (26.41)	570 (1.35)	36648 (86.95)	5500 (13.05)	42148 (100.00)
Sujangarh	37029 (52.31)	12121 (17.12)	1819 (2.57)	508 (0.72)	1831 (2.51)	238 (0.34)	16157 (22.82)	1089 (1.54)	56836 (80.29)	13956 (19.71)	70782 (100.00)
District total	204272 (58.75)	50371 (14.49)	9637 (2.77)	1684 (0.48)	7607 (2.19)	769 (0.22)	69946 (20.12)	3399 (0.98)	291462 (83.83)	56223 (15.17)	347685 (100.00)

(Bracketed are percentages to total workers)

Source : Census of India, Rajasthan, 1971 & 1981.

Table .9 : Percentage Workforce Distribution in Different Sectors in 1971 and 1981

Tehsil	1971					1981				
	Cultivators	Agricultural Labourers	Household Manufacturing Industries	Other Workers	Total Workers	Cultivators	Agricultural Labourers	Household Manufacturing Industries	Other Workers	Total Workers
Dungargarh	83.51	4.52	1.26	10.71	100.00	80.58	2.10	1.72	15.60	100.00
Taranagar	79.05	7.85	1.93	11.17	100.00	88.20	1.86	1.19	8.75	100.00
Sardarshahr	79.11	2.68	1.62	16.59	100.00	71.90	4.46	2.00	21.64	100.00
Churu	65.80	3.21	4.23	26.76	100.00	56.96	4.97	3.68	34.39	100.00
Rajgarh	84.16	3.22	0.80	11.82	100.00	82.47	2.45	1.42	13.66	100.00
Ratangarh	70.12	3.80	3.66	22.42	100.00	65.07	3.29	3.88	27.76	100.00
Sujangarh	74.79	5.04	2.83	17.34	100.00	69.43	3.29	2.92	24.36	100.00
Total	76.65	4.19	2.33	16.83	100.00	73.24	3.25	2.41	21.10	100.00

Table 2.10 : Settlement of Urban Population in 1981

D Tehsil/ District	Type and No. of Cities	Total Population			Sex Ra- tio	% Growth rate of popu- lation 1971-81	Literates as % of total Population		
		T	M	F			T	M	F
Taranagar	1 (M)	15435 (4.48)	7866 (4.45)	7569 (4.50)	962	+21.34	34.03	46.86	20.70
Rajgarh	1 (M)	30379 (8.81)	15806 (8.94)	14573 (8.67)	922	+31.06	36.54	49.29	22.70
Sardar Shahr	1 (UA)	56481 (16.38)	29192 (16.52)	27289 (16.24)	935	+47.29	43.81	55.84	30.95
Churu	1 (UA)	62061 (18.00)	32548 (18.42)	29513 (17.57)	907	+16.69	40.17	55.83	22.89
	2Ratan nagar	7637 (2.22)	3797 (2.15)	3840 (2.29)	1011	+41.69	33.49	48.06	19.09
Dungar- garh	1 (M)	29056 (8.43)	14717 (8.33)	14339 (8.53)	974	+35.70	39.72	50.38	28.79
Ratangarh	1 (M)	43366 (12.58)	22283 (12.61)	21083 (12.55)	946	+37.64	40.28	54.67	25.07
	2Rajal deshar(M)	15243 (4.43)	7571 (4.28)	7672 (4.57)	1013	+18.42	33.43	44.46	22.54
Sujangarh	1Bidasar(M)	17818 (5.17)	8888 (5.03)	8930 (5.31)	105	+58.13	30.39	40.46	20.37
	2Chhapar(T)	11705 (3.40)	5742 (3.25)	5963 (3.55)	1038	+20.91	37.80	47.56	28.41
	3Sujangarh (M)	55546 (16.11)	28300 (16.01)	27246 (16.22)	963	+42.16	40.47	58.83	25.56
Churu	(8M) (2UA) (1 Town)	344727 (100.00)	176710 (100.00)	168017 (100.00)	951	+33.29	39.16	52.39	25.25

Source : Census of India, Rajasthan, 1981.

Note : M = Municipal Town; UA = Urban Agglomeration
T = Town

(Bracketed figures are percentage to total of row)

Table 2.11 : Sector-wise Worker Distribution in Different Towns in 1981

Towns		Total Workers	Culti- vators	Agricul- tural Labour- ers	House- hold Industry	Other Worker	Worker Popula- tion Ratio
Taranagar	(M)	3857 (100.00)	1862 (48.29)	167 (4.32)	156 (4.04)	1672 (43.35)	24.99
Rajgarh	(M)	7208 (100.00)	1976 (27.42)	468 (6.49)	385 (5.34)	4379 (60.75)	23.73
Sardarshahr	(UA)	13751 (100.00)	1574 (11.45)	1285 (9.34)	941 (8.64)	9636 (70.07)	24.35
Churu	(UA)	15820 (100.00)	1454 (9.19)	969 (6.13)	1263 (7.98)	12134 (76.70)	25.49
Ratannagar	(T)	1661 (100.00)	467 (28.12)	310 (18.66)	74 (4.46)	790 (47.56)	21.75
Dungargarh	(M)	6638 (100.00)	2096 (31.58)	296 (4.46)	474 (7.14)	3772 (56.82)	22.85
Ratannagar	(M)	10389 (100.00)	1677 (16.15)	445 (4.28)	832 (8.01)	7435 (71.56)	23.96
Rajaldeshar	(M)	3757 (100.00)	1765 (46.98)	149 (3.97)	405 (10.78)	1438 (38.27)	24.65
Bidasar	(M)	4254 (100.00)	1583 (27.21)	143 (3.36)	268 (6.30)	2260 (53.13)	23.87
Chhapar	(M)	2644 (100.00)	1050 (39.71)	65 (2.46)	90 (3.40)	1439 (54.43)	22.59
Sujangarh	(M)	13310 (100.00)	2368 (17.79)	210 (1.58)	1129 (8.48)	9603 (72.15)	23.96
District Total		83289 (100.00)	17872 (21.46)	4527 (5.44)	6017 (7.22)	54873 (65.88)	24.16

Note : M = Municipal Town; T = Town; UA = Urban Agglomeration

(Bracketed figures are percentages to total number of workers)

Source : Census of India, Rajasthan, 1981.

Urbanisation

The process of urbanisation has been slow in the district. In fact, as compared to 1971 the share of urban population has been lower in 1981. The urban population registered a decadal growth of 33.29 per cent (1971-81) whereas its rural counterpart grew at 35.02 per cent. The district has in all eleven towns. Of these two are "urban agglomerations" consisting of more than one settlement each. These two towns have a population approaching 30,000 each. Another town, Sujangarh, also has a population of similar order. The only other town having over 20,000 population is Ratangarh. Two other towns have a population between 10 to 20 thousands. Rest five towns are, small with less than 10,000 population, one of them (Ratangarh) being very small with a population of only around 4,000.

The size structure of towns of Churu district thus suggest a low urban base. Even the growth of urban population has been slower than the overall growth in the district. Most towns appear rural as is indicated by a significant proportion of workers engaged in agriculture, as also by a sex ratio higher than the overall average for the district. Occupational structure of these towns also does not suggest any sound and dynamic economic base, since the industrial activity which can provide such a base is meagre in most of the towns.

CHAPTER III

Incidence of Drought

Drought causes ecological distress of varying degree depending upon its intensity. Various disciplines have defined drought in different terms for their respective purposes. Meteorological drought for instance is a situation when there is a significant (more than 25 per cent) decrease from the normal precipitation over an area. Similarly, hydrological drought is said to occur when there is marked depletion of surface water and consequently the reservoirs, lakes, streams and rivers etc. dry up and there is a fall in the ground water levels.

Drought affects human and cattle population as well as the plant life. Being predominantly an agricultural economy the most important concept of drought from our point of view is the agricultural drought. Since a majority of the population depends upon agriculture for their livelihood. Agricultural drought occurs when the supply of moisture from rainfall or from the soil is not sufficient to meet even the minimum requirements of the plants. They are therefore generally the result of irregular and variable rainfall. They are usually recognised during the periods when the crops are in greater need of water and when rainfall and soil moisture are together inadequate to support the crop and its growth.

For the identification of drought in India various criterion have been adopted by the Irrigation Commission (1972), the National Commission on Agriculture (1976) and the various state government.

The Irrigation Commission while defining drought in 1972 said that drought is a situation occurring in an area in a year when the rainfall is less than 75 per cent of the normal. It defined 'moderate drought' as obtaining where the rainfall deficit is between 25 to 50 per cent and 'severe drought' where the deficit exceeds 50 per cent. Areas where drought has occurred as defined above in 20 per cent of the years examined, are considered drought years, and where it has occurred in over 40 per cent of the years, as chronic drought areas. The Commission has recommended the exclusion of such areas where 30 per cent of the cultivated area is irrigated, from the list of drought districts on the ground that irrigation facilities have reached a stage where agriculture has been reasonably protected against drought.

Similarly, the National Commission on Agriculture defined agricultural drought as an occasion when the rainfall in a week is half or less of the normal, when the normal weekly rainfall is 5 mm. or more. The drought is a period of four such consecutive weeks in the period middle of May to middle of October or six such consecutive weeks during the rest of the year.

The State Governments have, likewise, given their own definition for the identification of drought areas. The criteria adopted by the states vary somewhat depending upon the prevailing situations and conditions. The Government of Rajasthan, for instance, has classified drought areas where the ratio of good crop year to scarcity year was 2:1 or less and where 15 per cent of the villages of the area were affected by drought. Let us now turn our attention to the extent of rainfall and the level of irrigation obtained in Churu since both are important in the classification of a district as drought prone.

Rainfall

The district receives rainfall from south-west monsoon. During the period June to September Churu receives highest rain accounting for over 85 per cent of the total annual rainfall. The average annual rainfall of the district is 339.4mm. July is the month of maximum rainfall. The highest annual rainfall of 921.43 mm was recorded in 1917. Rainfall in the post monsoon period is insignificant and contributes around 13.3 per cent of the annual rainfall. Periods during October-November and January - May account for 2.5 per cent and 10.8 per cent rainfall of the district, respectively.

During the whole year there are 20.01 rainy days on an average in the district. The normal monthly rainy days vary from 0.17 in November to 5.25 in the July. The normal

intensity of rainfall is 17.04 mm/day for the period 1907-1980. During the period of 1944-80 and 1907-43 the normal intensity was 17.93 mm/day and 16.3 mm/day respectively. The rainfall characteristics between the years 1907 to 1943 and 1944 to 1980 are being given below and have subsequently been analysed.

Table 3.0

Characteristics of Rainfall During 1907-43 and 1944-80

Sl. No.	Characteristics	Total	1907-43	1944-80
1.	Normal annual rainfall (mm)	340.94	316.2	367.35
2.	Percentage of rainfall from South-west monsoon	86.70	85.8	87.50
3.	S.D. of annual rainfall	141.00	143.91	134.81
4.	C.V. of annual rainfall	41.35	45.51	36.70
5.	Maximum annual rainfall (mm) & year	921.43 1917	921.43 1917	746.61 1978
6.	Minimum annual rainfall (mm) of year	78.47 1918	78.47 1918	167.39 1979
7.	Normal number of rainy days in a year	20.01	19.40	20.72
8.	Normal intensity of annual rainfall (mm)	17.04	16.03	17.73

It can be seen from the table that the normal annual rainfall during the period 1907-43 was less than that during 1944-80 while standardisation of the period 1907-43 is higher than in 1944-80. Similarly maximum annual rainfall during 1907-43

has been higher as compared to 1944-80. There were more rainy days 20.72 in the year of 1944-80.

Adequacy of rainfall should be measured in terms of its availability at the appropriate time; at the time when the respective crops require it most. Timely rainfall would mean a proper crop which will be reflected in total production and in the ultimate welfare of the cultivators. In the case of Churu unfortunately even though the total rainfall is not very insufficient it is not distributed during the period when it's need is maximum. Rainfall is needed most during June and July for the sowing of the Kharif crops. The average rainfall during June and July is 34.89 and 113.47 mm respectively. However, if we look at the figures of actual rainfall year-wise from 1970 to 1980 we find that in four years the rainfall received was around normal or above average yet in either of the two months or in both the months the rainfall received was below the monthly average. On the whole, in as many as five years the monthly rainfall of June as well as July was below the normal average rainfall. Rainfall received at an in appropriate time does not benefit agriculture in any way.

Irrigation

While rainfall is low and erratic, Churu does not fare very well in terms of irrigation facilities either, since it is among the least developed districts of Rajasthan from the point of view of irrigation. The district has no perennial

rivers consequently no major or medium irrigation work can be taken up with the existing resources of the district.

Table 3.1

Classification of Irrigation Resources in 1970-71 & 1979-80

Tehsil/District	(area in hectares)			
	1970-71		1979-80	
	Net Irrigation through tubewells & wells	% Irrigated area to total irrigated area	Net irrigation through tubewells & wells	% of irrigated area to total irrigated area
Dungargarh	15	6.52	59	13.26
Taranagar	-	-	-	-
Sardarshahr	20	8.70	32	7.19
Churu	32	13.91	30	6.74
Rajgarh	109	47.39	200	44.94
Ratangarh	3	1.30	49	11.01
Sujargarh	51	22.17	75	16.85
District Total	230	100.00	445	100.00

The ground water resource potential has not yet been properly worked out nor has it been properly tapped. They however are the main sources of irrigation as well drinking water. The water from ground is obtained through wells and tubewells.

In 1970-71 the net irrigated area in the entire district was only 230 hectares while gross irrigated area was 392 hectares. By 1979-80 these figures had gone up to 445 and 790 hectares respectively, but net irrigated area as a percentage to net cultivated area was still barely 0.05 per cent.

During the period 1970-71 highest net irrigated area was found in the tehsil Rajgarh and lowest irrigated area in the tehsil Ratangarh. Tehsil Taranagar had no water resources available either in the year 1970-71 or in 1979-80 and almost the entire cultivated area is unirrigated. Accordingly in the year 1979-80 in tehsil Rajgarh again represents highest level of irrigated area (accounting 44.94 per cent to district irrigated area) among the tehsils Sujangarh comes second while Taranagar continues to be deprived of irrigation facilities.

During the ten year period the irrigated area of the district has increased by 93.48 per cent which is quite heartening and shows the determination with which the government is trying to develop irrigation in such desert area of Churu. All the five tehsils show increasing trend in the irrigated area. However, in tehsil Churu there is a very slight decrease in net irrigated area although even there the gross irrigated area has increased.

It is observed that in the district as a whole only 0.05 per cent of cultivated area was irrigated in 1979-80. The

percentage of tehsil Rajgarh is 0.14 which is almost two and a half times higher than the district average. The tehsil Dungargarh, Ratangarh and Sujangarh have equal ratio with district average and Sardarshahr and Churu have less than district average of irrigated area to net cultivated area.

In all of the tehsils except Rajgarh the irrigated area was used for the cultivation of foodgrains in 1970-71. In the tehsil Rajgarh however, other crops like Guwar, vegetables and fruits were produced over a higher percentage of irrigated area while foodgrains were grown in only 38.39 per cent of irrigated land. In the district as a whole one third irrigated area was used for the production of vegetables and other non-food-grain crops 63.52 per cent irrigated area was put under the foodgrains production. In 1979-80, 67.97 per cent of irrigated area was under foodgrain crops. Percentage of irrigated area producing vegetables, fruits and other non-foodgrain crops has declined from 36 per cent in 1979-80, to 19 per cent in 1970-71. This is so because in 1970-71 pulses and cotton were not grown on irrigated land while only 0.5 per cent of the irrigated area was under oil seeds. By 1979-80, however, 8, 3 and 2 per cent of the area was under pulses, oilseeds and cotton respectively. Area under foodgrains had also increase by over 5 per cent.

In Dungargarh tehsil the proportion of irrigated area devoted to the production of crops other than the cereals has increased from 9 per cent in 1970-71 to 52.17 in 1979-80.

The reverse trend is observed in Rajgarh where the irrigated area under cereals has increased from 38.39 per cent in 1970-71 to 78.02 per cent in 1979-80. Besides Dungargarh all other tehsils grow cereals on a relatively larger proportion of irrigated area as compared to other crops.

Looking at crop-wise irrigation in the district (1979-80) it is observed that fruits and vegetables have the highest irrigated area (76.16 per cent) to the total area under them. In the case of wheat also this area is fairly high (63.60 per cent). The only other crops that have a substantial irrigated area to total area are Mustard (56.82 per cent) and Barley (30.95 per cent). The irrigated area under these crops has increased as compared to 1970-71. However, all these four crops have only a small proportion of area under them.

Assessment of Drought in the District

The district was effected by drought in as many as 15 years between the period 1960 and 1980. Of these 1963, 1965, 1967, 1972 and 1979 were the years of severe drought. Only 1964, 1975 and 1978 were drought free year and had a good crop.

The cultivated area production and loss of crop during the periods 1970-71 to 1979-80 is given in the Table 2.3.

From the time series data relating to agriculture between the years 1970-71 and 1979-80 we have worked out the average area, average production and average per hectare productivity

Table 3.2

Crop-wise Total Cultivated Area and Irrigated Area in
1970-71 and 1979-80

Crops	(in hectares)					
	1970-71			1979-80		
	Total area	Irriga- ted area	% Irri- gated area	Total area	Irriga- ted area	% Irri- gated area
Bajra	404369	47	0.01	409438	49	0.01
Jawar	386	-	-	14	1	7.14
Wheat	499	182	36.47	662	421	63.60
Maize	1	-	-	1	-	-
Barley	50	16	32.00	210	65	30.95
Gram	62316	4	0.01	27498	62	0.23
Kharif Pulses	425313	-	-	301666	2	Neg.
Till	555	-	-	508	-	-
Rai Mustard	2	2	100.00	44	25	56.82
Groundnut	-	-	-	-	-	-
Other Oil Seeds	2986	8	0.27	1613	25	1.55
Sunhemp	3	-	-	-	-	-
Collon	4	-	-	3	-	-
Tabacco	-	-	-	15	-	-
Chilly	-	-	-	9	-	-
Gowar	346303	3	Neg.	137825	9	0.01
Fruits and vegetables	185	130	66.67	172	131	76.16
Total Area	1242972	392	0.03	879686	790	0.09

Source : District Statistical Hand Book Churu, Directorate of
Economics and Statistics, Jaipur, Rajasthan.

Table 3.3

Years	Net cultivated area (hectares)	Production (in tonnes)	Deviation from normal production	% shortfall from normal output	Per hect. producti- vity in tonnes
1970-71	1232674	227740	+36727	-	0.18
1971-72	1234191	164830	-26183	13.7	0.13
1972-73	1214776	63549	-127464	66.7	0.05
1973-74	1256146	261417	+ 70404	-	0.21
1974-75	1260377	50305	-140708	73.7	0.04
1975-76	1286829	359509	+168496	-	0.28
1976-77	1272795	298099	+107086	-	0.23
1977-78	1264621	268935	+77922	-	0.21
1978-79	1251278	193340	+2327	-	0.15
1979-80	875151	22402	-168611	88.3	0.03
Normal average	1214884	191013	-	-	0.16

Source : District Census Handbook, Churu, Rajasthan.

of agricultural production. This ten year average is being treated as the normal year in order to find out the extent to which agricultural production has deviated from the mean in any particular year. It is evident from the table that in the case of the years 1971-72, 72-73, 74-75 and 79-80 the total agricultural production has fallen below our assumed mean. The loss has been greatest during the years 1979-80

and 1974-75 and 1972-73 in that order. Crop loss during 1971-72 has been of a much less degree which incidently has not been classified as a drought year either. The other three years have been listed as years of moderate or severe drought. Looking at productivity we find that in the above mentioned years and in the case of 1978-79 per hectare productivity is below the average. There was only a marginal decrease in net cultivated area during 1972-73 from the average while in 1979-80 there was a substantial decrease in the net cultivated area. It can therefore be seen that drought has resulted in heavy crop losses in the district.

Resources

Having identified the district as a chronic drought prone area and the extent to which droughts affect crop loss and fluctuations in yield rates it is worthwhile to try and assess the ground and surface water potential of the district so as to see to what extent the exploitation of the resources can be utilised to extent irrigation over a larger area as compared to the present situation.

Ground Water

In the district, groundwater depth ranges from 5 to 90 mtrs. which was measured during the monsoon season in 1963-65. It is observed that water table is comparatively shallow in the basement crystalline rocks and close to the Kantli river.

The water table is deeper in the west and north of Sujangarh tehsil as compared to other tehsil areas. Locally ground-water occurs at shallow depths under purchased conditions, above impermeous clay beds. Such purchased bodies are of restricted extent and are not very dependable even as a source of domestic water supply. The slope of the water table is in the direction towards of the north or north-west. It is steeper in the bed rock aquifers north of Sujangarh and the continuous tend to parallel the fault line separating Sikar and Bikaner district. Very little difference is found in the depth of the water level in the dug wells and tube-wells suggesting that the water table and piezometric surface have nearly the same elevation.

There are much qualitative differences of ground-water within the district of Churu. In Taranagar and Rajgarh tehsil the groundwater is highly saline and is found along the Kantli river south of Rajgarh and around Rampura, south of Dadrewa and north of Tambakheri. The quality of ground water in the bed rock aquifer to the west of Sujangarh is potable and near the border of Sikar the quality is better still. While in most of the areas of district Churu is characterised by high salinity with the chloride content exceeding 2000 ppm.

Rainfall is an important source of ground-water recharge in the district. There is a possibility to provide surface water irrigation facilities with the extention of Rajasthan

canal project in the north eastern part of the district. There will be a substantial increase in the recharge, once the project is commissioned.

Present Ground Water Development

Ground water is only a single source for irrigation in the district Churu. Census of India 1971, indicates that there is only 0.019 per cent of area is under irrigation and remaining area purely depends on rainfall. In 1979-80, net irrigated area rose to 0.08 which is hardly an achievement worth talking about. Only 4535 hectares land is put under double cropping while the net cultivated area is 875151. The whole area is irrigated by tubewells. It is estimated that ground water draft for irrigation is very less which is applicable from Sikar and Bikaner basin amounting 2.43mcm/yr and 1.17 mcm/yr respectively. In the district, present ground water draft is 14.66 mcm/yr. Out of the given quantity 11.06 mcm/yr is being used for domestic consumption and the remaining 3.60 mcm/yr is being utilised for irrigation.

In the district 735 villages are getting drinking water from wells and 16 villages are having tubewells while only 3 towns have protected water supply and remaining 8 towns and 115 villages depend on tanks and other sources.

During 1978 Central Ground water Board investigated the quality of ground water available from wells for drinking.

The quality of ground water in most of the villages falls much below the minimum standard with respect to salinity. In some of the villages water contained chlorides amounting in excess of 500 ppm and 1000 ppm. The present ground water draft of domestic use from Churu district is 6.64 mcm/yr and from Sikar 4.42 mcm/yr.

The average depth of the dug wells is 100 mtrs. and shape is circular with cement rings or masonry lining while for tube wells the depth ranges from 41.0 mtrs. to 1230 mtrs., and discharge ranges from 12.3 mtrs to 44.0 mtrs. per hect. for drawdowns ranging from 0.76 to 20.41 mtrs. Dug wells yield from @30,000 to @50,000 lpd and sometime in exceptional cases have touched about @150000 lpd.

Surplus of Ground Water

There are two organisation engaged in the assessment of ground water resources. The organisation are State Ground Water Board and Central Ground Water Board.

State Ground Water Board Rajasthan conducted a survey in the district during the period of 1972-73 and measured the following ground water potentials.

Recharge	:	197.9515 MCM
Draft	:	17.1822 MCM
Surplus	:	180.7683 MCM

Central Ground Water Board have estimated the ground-water potentials is 1980 and follows in two sets which are given below :

I Set (Western Region Jaipur Publica- tion - 2)	Recharge	:	195.04 MCM
	Draft	:	14.66 MCM
	Surplus	:	180.38 MCM
II Set (Delhi Publica- tion - 3)	Recharge	:	80.00 MCM
	Draft	:	26.07 MCM
	Surplus	:	53.93 MCM

Later in 1982 ground water assessment was made by special Schemes Organisation, Jaipur which have given the following position of the ground water in the district :

Recharge	:	210.1400 MCM
Draft	:	11.3433 MCM
Surplus	:	198.9767 MCM

In the district attention has been given to the measurement of the ground water potential at different time periods. Analysis done by these agencies indicates that the district is having sufficient ground water potentials but the utilisation of the existing resources is found to be negligible. Hence maximum utilisation of these resources on agricultural farms may result in higher level of irrigation and consequently higher crop production may be achieved.

Surface Water

The lack of storage or diversion sites, lack of adequate levels and the environmental condition make it difficult to fully exploit all the surface water resources available in the district.

Neither the State Government nor any other organisation have so far made any attempt to develop major or minor irrigation projects in the district. Irrigation systems could not be developed because of the absence of perennial or seasonal rivers in the district. Similarly no gauge and discharge observations were carried out as a result there is no data pertaining to the surface water potential in Churu. The Central Water Commission in its report on Churu have found Khosla's formula the most appropriate for the assessment of surface water potential, and have worked out details of the surface run-off with the help of this formula. It is, however, pointed out that a major part of the district is covered with sand dunes and by the Aravali Hills in the South Eastern part. At the same time there is high evaporation and low and erratic rainfall. Thus the rainfall is lost to either evaporation or in absorption by the soil which is porous. Hence even the figures of surface run off obtained by Khosla's formula can not be relied upon as the field capacity of the soil has not been considered. The water balance method has ultimately been found more acceptable. Utilisable flow in the district has been taken as only 50 per cent of the average normal run-off

as worked out by the Water Balance Method, because of the various difficulties like inadequate storage facilities and the erratic rainfall. The utilisable run-off is given in the table below.

Table 2.4

Utilisable Run-off in Churu District in MCM

Sl. No.	Tehsil/District	Normal Run-off	Utilisable Flow
1.	Taranagar	14.0	7.00
2.	Rajgarh	18.9	9.45
3.	Sardarshahr	26.6	13.30
4.	Churu	3.6	1.80
5.	Dungargarh	13.9	6.95
6.	Ratangarh	4.5	2.25
7.	Sujargarh	32.7	16.35
Churu District		114.2	57.10

CHAPTER IV

Agriculture

Agriculture is the mainstay of the people with a majority of the population dependent upon it for their means of livelihood. In Churu 70.69 per cent of the total population lives in rural areas and out of its total workforce 76.49 per cent is constituted by cultivators and agricultural labourers. However, desert type sandy soil, existence of numerous sand dunes, erratic rainfall and a very low level of irrigation make conditions rather difficult for agriculture. The net irrigated area as a percentage of net area sown is barely 0.05 per cent. People have been therefore engaged in subsistence farming mainly based on single cropping. The double cropped area is meagre 0.51 per cent of the net area sown.

Land Use Pattern

The total geographical area of the district is 1686200 hectares. Nearly three-fourth's of this area (73.10 per cent) is the actual figures being 73.10 in 1970-71 and 74.20 per cent in 1978-79 under cultivation, Taranagar tehsil had the highest percentage of net area, under cultivation (85.37 per cent) while Sardarshahr had the lowest figures (64.71 per cent) among the seven tehsils of the district.

Table 4.0 : Land Use Pattern in 1979-80

Tehsil/ District	1979-80						
	Percentage Area Under Cultivable Waste to Geogra- phical Area	Percentage Fallow Land to Geogra- phical Area	Percentage Net Area Sown to Geo- graphical Area	Percentage Area Under Forest to Geographical Area	Percentage Area not Available Cul- tivation to Geographical Area	Percentage Net Irrigated Area to Net Area Sown	Percentage Area under Double to Cropped Area
Dungargarh	3.64	46.60	36.78	0.33	12.65	0.05	0.37
Taranagar	3.90	33.24	59.78	0.23	2.85	-	1.66
Sardarshahr	4.70	37.58	50.55	0.07	9.67	0.02	0.47
Churu	7.27	32.43	57.44	0.98	1.88	00.03	0.73
Rajgarh	4.87	24.33	65.06	0.76	5.08	0.14	0.42
Ratangarh	3.18	36.78	54.17	0.09	6.78	0.05	0.04
Sujargarh	3.13	40.91	49.89	0.03	5.77	0.06	0.06
Total	4.28	36.84	51.90	0.35	6.62	0.05	0.51

Source : District Statistical Hand Book, Churu, Directorate of Economics and Statistics, Jaipur, Rajasthan.

Table 4.0

Pattern in 1970-71

Tehsil/ District	1970-71						
	% Area Un- der cultiva- ble waste to Geo. Area	% Fallow land to Geo. Area	% of net area to Geo Area	% Area un- der forest to Geo. Area	% Area not available to Geo. Area	% net irri- gated area to net area sown	% areas under dou- ble cropp- ers
Dungargarh	7.80	17.65	68.85	0.66	5.54	0.01	-
Taranagar	1.72	6.86	85.37	-	6.05	-	5.20
Sardarshahr	6.88	20.92	64.71	-	7.49	0.01	0.01
Churu	1.49	10.91	77.42	-	10.18	0.03	0.02
Rajgarh	3.47	15.75	73.15	-	7.63	0.07	0.46
Ratangarh	3.35	13.33	79.20	-	4.12	N.A.	0.15
Sujargarh	2.59	14.89	74.52	-	8.01	0.03	0.38
District Total	7.02	15.40	73.10	0.02	4.36	0.02	0.84

Source : Statistical Handbook, District Churu, Directorate of
Economics and Statistics, Jaipur, Rajasthan.

In the district fallows, both current fallows and other fallows occupy an important place in the land use pattern and accounted for 6.59 and 8.80 per cent respectively in 1970-71. The area under current fallows went up slightly by 1978-79 (8.15 per cent) while other fallows registered a marginal decline (7.62 per cent). Area under fallows are susceptible to wide fluctuations as a result of drought. If for instance we take the figures of land use pattern for 1979-80, which incidentally was a year of severe drought we find that net area sown declined very sharply and was reduced to only 51.90 per cent whereas to 1970-71 (25.31 per cent). Such fluctuations were also evident at the tehsil level. Taranagar tehsil which had the highest net area under cultivation in 1971 had a 25 per cent drop in its net cultivated area. Similarly in Dungargarh the decrease was from 68.85 per cent to 36.78 per cent. The drop in cultivated area was relatively less in Rajgarh with the result that in 1979-80 it stood out as the tehsil with the highest net cultivated area. One factor which could possibly be responsible for this is the fact that between 1970-71 and 1979-80 there has been an improvement in the irrigation facilities in Rajgarh.

With around 90 per cent of the total area being accounted for by net cultivated area as well as fallows it is obvious that forests, pastures etc. cover an insignificant area under them.

Size Distribution of Land Holding

Having outlined the land use pattern of the district we can now focus our attention on the land holding size and their distribution. The data for this purpose had been taken from the Census of land holdings for the years 1970-71 and 1976-77. The district had in 1976-77, 1497138.13 hectares under land holdings divided among 109617 holdings of different sizes yielding an average size of holdings at 13.66 hectares. The Census figures classify holdings in twelve size groups ranging from below 0.5 hectares to above fifty hectares. However, for the purpose of analytical convenience we have further reduced the land holdings to three size groups only : upto 5 hectares, 5 to 10 hectares, and more than 10 hectares.

The highest number of operational holdings were concentrated in the size group above 10 hectares. They had over half of the total holdings (56.94 per cent) in 1970-71. The second important size group was that between 5 to 10 hectares and accounted for slightly over one-fourth (26.48 per cent) of the total holdings. Holdings below five hectares were relatively less (16.54 per cent). By 1976-77 also there was no significant change in this pattern and the size group 10 hectares and above continued to dominate with over half the total holdings. However, there was a shortfall in this percentage from 56.94 to 51.92. This decrease of five percent was almost equally divided between the two remaining size groups with holdings between 5 to 10

Table 4.1

Distribution of Land Holdings by Size Groups in Churu 1970-71
& 1976-77

Size of Holdings	No. of Operational holdings		Area under the holdings		Average size of holdings	
	1970-71	1976-77	1970-71	1976-77	1970-71	1976-77
Upto 5	16857 (16.58)	21042 (19.20)	54398.92 (3.64)	64574.47 (4.31)	3.22	3.07
5 - 10	26934 (26.48)	31663 (28.88)	194330.07 (12.97)	234331.77 (15.65)	7.22	7.40
10 +	57907 (56.94)	56912 (51.92)	1249166.83 (83.39)	1198231.89 (80.04)	21.57	21.05
Total	101698 (100.00)	109617 (100.00)	1497895.82 (100.00)	1497138.13 (100.00)	14.73	13.66

Source : Agricultural Census of India, 1971-77.

hectares forming 28.88 per cent while holdings below 5 hectares accounting for 19.20 per cent of the total holdings.

Size group above 10 hectares being the predominant group also accounted for a very high total area under it. The percentage of area under these holdings to total area being 83.39 per cent. Size group 5 to 10 hectares with 26.48 per cent holdings had only 12.97 per cent of the area. The smallest size group of land holdings had only 3.64 per cent of the total area under the land holdings. Between 1970-71 and 1976-77, one does not find much difference in the area under the different size groups of holdings. There was, however, a decline in

Table 4.2 : Size Class-wise, Area and Average Size of Operational Land Holdings (in Hectares)

Size Class in Hectares	No. of Operational Holdings		%Variations	Area of Operational Holdings		%Variations	Average Size of Operations	
	1970-71	1970-71	(+) (-)	1970-71	1976-77	(+) (-)	1971	1976-1977
< .50	383 (0.38)	864 (0.79)	125.59	102.54	185.42	+81.37	0.27	0.21
.50 - 1	557 (0.55)	800 (0.73)	43.63	520.77	599.99	+15.38	0.93	0.75
1 - 2	2060 (2.03)	2713 (2.47)	31.70	3182.56	4107.45	+29.07	1.54	1.51
2 - 3	3783 (0.37)	4686 (4.27)	23.87	9702.53	11708.56	+20.68	2.56	2.50
3 - 4	5015 (4.93)	5917 (5.40)	17.99	17721.17	20854.59	+17.68	3.53	3.52
4 - 5	5059 (4.97)	6062 (5.53)	10.83	23169.35	27118.46	+17.04	4.58	4.47
5 - 10	26934 (26.48)	31663 (28.89)	17.56	194330.07	234331.77	+20.58	7.22	7.40
10 - 20	32715 (32.17)	34604 (31.57)	5.93	429219.33	493282.73	+14.93	13.12	7.40+
20 - 30	13690 (13.46)	13071 (11.92)	-4.52	313420.34	316042.35	+ 0.84	22.89	23.08+
30 - 40	6156 (6.05)	5467 (4.99)	-11.19	213384.38	188011.27	-11.89	34.66	34.39
40 - 50	2753 (2.71)	2096 (1.91)	-23.86	124489.74	92814.51	-25.44	45.22	44.28
50 +	2593 (2.56)	1674 (1.53)	-35.44	168653.04	108081.03	-35.92	65.04	64.56
Total	101698 (100.0)	109617 (100.0)	- 7.84	1497895.82	1497138.13	- 0.05	14.73	13.66

(Bracketed are percentages to raw totals)

Source : Agriculture Census of India 1971-77.

the number as well as percentage of holdings of above 10 acres, as well as area under them, accompanied by a corresponding increase in the case of holdings in the other two size groups. Relative gains and losses were larger in number of holdings than in area, in the largest and smallest groups, but the middle group gained more in area than in holdings.

The average size of land holdings in the district as a whole has registered a slight drop in 1976-77 as compared to 1970-71 by slightly over one hectare. Looking at the average land holding size among the different sizes of land holdings we find that only the size group 5 to 10 hectares shows an improvement in the average land holding size which has gone up from 7.22 hectares to 7.40 hectares. In the case of the other two groups there has been a decrease in the average size of land holdings. The increase in the number of smaller size holdings at the cost of holdings of the larger size as well as the reduction in the average land holding size reflects the fragmentation and sub-division of holdings caused by division within the family and the sale of land in the district. The average size of land holdings in the district apparently seem to be quite large. It should, however, be kept in mind that although the average land holding size is pretty high in both the years, the type of soil, extent of irrigation and the vagaries of rainfall do not allow the cultivators to reap maximum advantage of this high land holdings size.

Cropping Pattern

Let us now examine the cropping pattern as obtained in Churu. Although a variety of crops are grown in the district only a few of them occupy any position of importance when viewed in terms of the area under them as a percentage to the gross cropped area. These crops are Bajra, pulses among which gram is one of them, and guwar.

Bajra is the staple food of the district and is grown extensively all over. It owes its importance primarily to the fact that it requires relatively less water for cultivation. In the year 1970-71 Bajra was sown over 32.53 per cent of the gross cultivated area. There was a slight decrease in the area under it in 1978-79 (31.14 per cent) but in 1979-80 it rose sharply to 46.54 per cent. This general pattern is found in the different tehsils as well. However in 1979-80 Sujangarh had about 67 per cent of its gross cropped area under Bajra while in the case of Sardarshahr the percentage was only 36.69.

Along with Bajra, pulses claim the maximum area under cropping. In 1970-71 it had, in fact, a much higher area (39.39 per cent) under it than even Bajra but this trend has not been sustained over the years since area under pulses came down in both 1978-79 (35.17 per cent) and 1979-80 (37.42 per cent). Among the tehsils Taranagar had the highest area under pulses (48.74 per cent) in 1979-80 while Sujangarh was

Table 4.3

Cropping Pattern in 1970-71, 1978-79 and 1979-80

(Area in hectares)

Name of the Crops	1970-71		1978-79		1979-80	
	Area	% to gross cropped area	Area	% to gross cropped area	Area	% to gross cropped area
Bajra	404369	32.53	396282	31.14	409438	46.54
Jawar	386	0.03	235	0.02	14	Neg.
Wheat	499	0.04	1027	0.08	662	0.08
Maize	1	Neg.			1	Neg.
Barley	50	0.01	117	0.01	210	0.02
Total Foodgrains	405305	32.61	397661	32.24	410325	46.64
Gram	62316	5.01	105656	9.30	27498	3.13
Total Pulses	487629	39.39	454507	35.71	329164	37.42
Till	555	0.04			508	0.06
Rai Mustard	2	Neg.			44	0.01
Groundnut	-	-			8	Neg.
Others	2986	0.24			1613	0.18
Total Oilseeds	3543	0.28	5252	0.41	2173	0.25
Sunhemp	3	Neg.			-	-
Cotton	4	Neg.			3	Neg.
Tobacco	-	-			15	Neg.
Chilly	-	-			9	Neg.
Guwar	346303	27.86	415209	32.62	137825	15.67
Fruits and vegetables	195	0.02	154	0.01	172	0.02
Gross cropped Area	1242972	100.00	1272783	100.00	879686	100.00

Sources : District Statistical Handbook, Churu, Directorate of Economics and Statistics, Jaipur, Rajasthan.

Table 4.4

Percentage, Distribution of Area Under Various Crops in 1979-80

Crops Tehsils	Dungar garh	Tara Nagar	Sardar Shahr	Churu	Rajgarh	Ratan garh	Sujan Garh	Total Distri- ct
Bajra	51.52	39.03	36.69	43.84	47.43	42.33	66.80	46.55
Jawar	-	-	-	-	0.01	Neg.	Neg.	Neg.
Wheat	0.01	0.02	0.11	0.07	0.19	0.03	0.04	0.08
Barley	Neg.	0.07	0.02	0.04	0.02	-	0.02	0.02
Total Food								
Grains	51.53	39.12	36.82	43.95	47.65	42.36	66.87	46.65
Gram	0.24	12.67	2.74	0.94	4.84	0.01	0.01	3.13
Other								
Kharif								
Pulses	44.29	36.07	35.86	35.33	27.75	39.99	24.73	34.30
Total								
Pulses	44.53	48.74	38.60	36.27	32.59	40.00	24.74	37.43
Telhan	0.14	Neg.	Neg.	Neg.	0.04	Neg.	0.09	0.06
Rai Mus-								
tard	Neg.	-	0.01	Neg.	0.01	Neg.	0.01	0.01
Others	0.27	0.26	0.21	0.63	0.03	0.02	-	0.14
Total								
Oilseeds	0.41	0.26	0.22	0.63	0.02	0.12	0.18	0.25
Cotton	-	Neg.	-	-	Neg.	-	-	Neg.
Tobacco	-	-	-	Neg.	0.01	-	-	Neg.
Chilly	Neg.	-	-	-	-	Neg.	-	Neg.
Guwar	3.52	11.88	24.36	19.11	19.73	17.52	8.21	15.67
Total								
Other								
Crops	3.52	11.88	24.36	19.11	19.74	17.52	8.21	15.67
Gross Cropped Area	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source : District Statistical Handbook, Churu, Directorate of
Economics and Statistics, Jaipur, Rajasthan.

found having the lowest area with only 24.73 per cent. Among pulses gram accounted for around five per cent of the area in 1970-71 and over 9 per cent in 1979-80. The drought of 1979-80, however, affected gram adversely as a result area under it came down to only 3.13 per cent. Among the tehsils Taranagar, even in the year of drought, had as much as 12.67 per cent of the area under gram and was thus very much ahead of the district average. Ratangarh and Sujangarh on the other hand had barely any area under gram in 1979-80.

Bajra and pulses together have jointly been covering between 70 to above 80 per cent of the gross cropped area of the district and this highlights the extent to which cultivators are dependent upon the coarse food grains alone primarily for their subsistence. Dungargarh and Sujangarh tehsils have over 90 per cent of their gross cropped area (1979-80) under Bajra and Pulses. In fact only Sardarshahr had an area of just over 75 per cent under these crops.

Guwar is another crop which is not only extensively cultivated but also has multiple usage. It is primarily an important cattlefeed. However, during times of distress and among the very poor it is also being used as a pulse. Moreover, of late, Guwar is being used as the basic input for the production of gum as well. Taking the three points of time that have been used earlier we find wide fluctuations in the area under Guwar with the highest area of 32.62 per cent in 1978-79 and the

lowest being 15.67 per cent in 1979-80. During 1970-71 it covered around 28 per cent of the area. Among the tehsils it covered the maximum area in Sardarshahr (24.36) and the lowest in Dungargarh (3.52 per cent) in 1979-80.

Among the superior food grains wheat is significant not because it is grown over a large area but because it is grown over areas which receive sufficient irrigation. Between 1970-71 and 1978-79 there was an over two-fold increase in the area under wheat although even the increased area was negligible considering the gross cropped area of the district.

Productivity

For analysing production and per hectare productivity of these important crops it will be better to restrict the study to only 1970-71 and 1978-79 since 1979-80 was a year of severe drought and productivity was adversely affected. In the case of Bajra which is the principal crop of the district the yield rates came down from 252 kg/hectare in 1970-71 to 110 kgs/ha. in 1978-79. Looking at the productivity rates of the State as a whole and of the country, Churu is far behind since during 1978-79 the average yield of Bajra was 253 kgs/hectares and 489 kgs/hectares for the State and the country respectively. This is a reflection of the degree to which agriculture is depressed in the district since the major food crop of Churu has an average productivity which is less than half of the State and less than one-fourth of the country as a whole.

Table 4.5

Yield and Production in 1970-71, 1978-79 and 1979-80

Production = M.T. & Yield

Crops	CHURU						Rajasthan		India	
	1970-71		1978-79		1979-80		1978-79	79-80	78-79	79-80
	Pro- duction	Yield	Pro- duc- tion	Yield	Pro- duction	Yield	Yield		Yield	
Jowar	183	487	24	400	3	214	401	181	792	699
Bajra	101900	252	43591	110	7370	18	253	89	489	373
Wheat	639	1280	1641	1598	987	1488	1444	1303	1568	1436
Kharif Pulses	97739	230	38395	110	7743	26	N. A.	278	N.A.	385
Gram	26671	428	48707	461	302	11	909	544	745	481
Barley	38	760	75	636	132	629	1346	1154	1172	917
Oilseeds	565	160	601	114	24	11	N.A.	240	N.A.	534
Guwar	1	-	60230	145	5825	42	-	-	-	-
Other	4	333	6	375	16	571	-	-	-	-

Source : District Statistical Hand Book Churu, Directorate of
Economics and Statistics Jaipur, Rajasthan.

Productivity has declined in the case of pulses as well in 1978-79 as compared to 1970-71 and the decrease has been considerable from 230 kgs/hectares to 110 kgs/hectares. However, if we look at gram individually we observe that while average yield was 428 kgs/hectares in 1970-71 it increased to 461 kgs/hectares in 1978-79. The district in any case does not compare well with either the State (909 kgs/hectares) or the country 745 kgs/hectares) even in the productivity rates of this pulse.

Wheat is the single crop which has shown a marked improvement in the yield rates from 1280 kgs/hectares in 1970-71 to 1598 kgs/hectares in 1978-79. In fact yield rates of wheat obtained in the district in 1978-79 were not only much higher than the state (1444 kgs/hectares) but also marginally higher than the average yield in India (1568 kgs/hectares). But it has already been pointed out that wheat occupies a very low position from the point of view of area under it since its cropping is restricted to the irrigated area, and as such the district can not take much advantage of these relatively higher yield rates of wheat.

On the whole, therefore, sandy soil, low irrigation level and inadequate rainfall have been working adversely on the yield rates of the district which are seen to be much less when one compares them with the corresponding average figures of either the State or of the country.

Inputs and Other Facilities

(a) Area Under High Yielding Varieties

Due to lack of irrigation facilities in the district a very small proportion of the gross cropped area (0.62 per cent) had been put under cultivation of high yielding variety of seeds. The soil of the district in general is less fertile and is not capable of sustaining the improved variety seeds. The main crops under HYV seeds are wheat and Bajra. Churu tehsil accounts for the highest area under HYV seeds. In the district as a whole only 1.27 per cent of the area under Bajra is used for the cultivation of HYV Bajra and thus the coverage under Bajra is insignificant. On the other hand, a substantial proportion (37.76 per cent) of area under wheat cultivation is covered by HYV. Among the tehsils Rajgarh comes first with 65.45 per cent of the total area under wheat growing high yielding varieties. Taranagar, however, has no area while Sardarshahr has slightly less than 5 per cent under HYV wheat.

In the district, emphasis is being given on increasing agricultural production through distribution of better quality seeds. The main seeds being distributed are Bajra, wheat, Juwar and gram. During 1979-80 maximum emphasis was laid on the distribution of HYV seeds of gram. Of the total distribution Taranagar received the maximum. Juwar was the second most important seed of which Sujangarh tehsil accounted for

Table 4.6

Area Distribution under HYV and Under Crops in 1979-80

Tehsil	(Area in hectares)								
	Area under Wheat			Area under Bajra			Total area under Wheat & Bajra		
	Total Area under wheat	Under HYV wheat	% Area under HYV wheat	Area under Bajra	Under HYV Bajra	% of HYV Total area	Total Area	Area under HYV	% HYV to total areas
Churu	61	24	39.34	40288	1975	4.90	40349	1999	4.95
Sardarshahr	207	10	4.83	71773	300	0.42	71980	310	0.43
Ratangarh	27	10	37.04	38980	1390	3.57	39007	1400	3.59
Sujargarh	55	20	36.36	89825	500	0.56	89880	520	0.58
Dungargarh	15	6	40.00	57098	311	0.54	57113	317	0.56
Rajgarh	275	180	65.45	68245	600	0.88	68520	780	1.14
Taranagar	22	-	NIL	43229	124	0.29	43251	124	0.29
District	662	250	37.76	409438	5200	1.27	410100	5450	1.33

Source : District Statistical Handbook, Churu, Directorate of Economics and Statistics, Jaipur, Rajasthan.

Table 4.7

Distribution of High Yielding Variety Seeds in 1979-80

Tehsil/ District	(Quantity in kg.)			
	Bajra	Wheat	Jowar	Gram
Churu	3600 (29.75)	2400 (25.00)	2000	10200 (21.03)
Sardarshahr	800	1000	200	500 (1.03)
Ratangarh	2500 (20.66)	1000	10000 (29.24)	1200 (2.47)
Sujargarh	2300 (19.00)	2000	19000 (55.55)	200 (0.41)
Dungargarh	900	600	3000	400 (0.82)
Rajgarh	1500	2500 (26.00)	-	15000
Taranagar	500	100	-	21000 (43.30)
Total District	12100	9600	34200	48500 (100.00)

Source : District Statistical Handbook, Churu, Directorate
of Economics and Statistics, Jaipur, Rajasthan.

over half the total distribution. Both wheat and Bajra were distributed in much less quantities although these are the two main crops which are also effectively grown in the district with the use of high yielding variety seeds.

(b) Fertilizer Use

It is generally observed that fertilizer use is a function of net irrigated area and the use of high yielding variety of seeds. Churu unfortunately has neither extensive irrigation facilities nor are HYV varieties as popular. As a result the consumption of fertilizers in the district is rather low. In the district as a whole only 26 metric tonnes of fertilizers was used in 1979-80 of which 22 metric tonnes was Nitrogenous fertilizer. Thus the per hectare use of fertilizer works out to less than half a kilogram. Rajgarh with a relatively higher irrigation facilities as well as better use of HYV seeds accounted for nearly 50 per cent of the total fertilizer consumption.

As a consequence of the low fertilizer consumption there are only two fertilizer and pesticide stores in Churu. They are located in Churu and Sujangarh tehsils each having storage capacity of 30 metric tonnes.

(c) Agricultural Tools and Implements

Wooden ploughs are the main agricultural implements used for cultivating land in Churu. Tractor use is extremely limited as the uneven land is not very suitable for ploughing

Table 4.8

Distribution of Fertilizer in Different Tehsils in
1979-80

Tehsil/District	Quantity in M. T.	
	Nitrogen, Amonian Sulphate	Phosphate Super Phosphate
Churu	2.50	0.50
Sardarshahr	1.00	0.90
Ratangarh	1.00	0.50
Sujangarh	4.50	1.00
Dungargarh	2.00	0.50
Rajgarh	10.00	0.60
Taranagar	1.00	-
District Total	22.00	4.00

Source : District Statistical Handbook, Churu, Directorate
of Economics and Statistics, Jaipur, Rajasthan.

with them. Ploughs are thus seen almost evenly distributed among the various tehsils of the district with Rajgarh claiming a slightly higher proportion than the others. Rajgarh also ranks first when all the agricultural implements are taken in totality. It also accounts for as many as 70 per cent of the total electric pumpsets which are used for lifting the groundwater for irrigation and drinking purposes. Rajgarh and Sujangarh, between them, have around 69 per cent of the total tractors in the district. On the whole therefore it is observed that the use of modern agricultural implements in general is found insignificant in the district as a whole.

Table 4.9

Tehsil-wise Distribution of Agricultural Implements and Tools
in 1977

(in numbers)							
Tehsil	Ploughs	Vehi- cles	Diesel Engines	Electric Pumps	Tractor	Ghanies	Total
Churu	10090 (11.06)	1041 (7.32)	-	22 (12.36)	1 (0.96)	-	11154 (10.55)
Sardarshahr	15505 (17.00)	1950 (13.71)	-	12 (6.74)	2 (1.92)	21 (48.84)	17490 (16.54)
Ratangarh	10155 (11.14)	1740 (12.24)	-	-	-	2 (4.65)	11897 (11.25)
Sujargarh	13448 (14.75)	4089 (28.76)	-	18 (10.11)	36 (34.62)	8 (18.60)	17599 (16.64)
Dungargarh	10443 (11.45)	3492 (24.56)	-	1 (0.56)	7 (6.73)	7 (16.28)	13950 (13.19)
Rajgarh	20055 (21.99)	1155 (8.12)	1 (100.00)	125 (70.22)	36 (34.62)	5 (11.63)	21377 (20.22)
Taranagar	11495 (12.61)	753 (5.30)	-	-	22 (21.15)	-	12270 (11.60)
District Total	91191 (100.0)	14220 (100.0)	1 (100.00)	178 (100.00)	104 (100.00)	43 (100.0)	105737 (100.00)

(Bracketed figures are percentages to column totals).

Source : District Statistical Handbook, Churu, Directorate
of Economics and Statistics.

(d) Godowns and Stores

There are 19 godowns and warehouses for storage of the agricultural produce and are either State owned or owned by co-operative agencies. Of these 8 are located in Dungargarh tehsil and three in Rajgarh. Churu has two while Sardarshahr has one. The capacity of these godowns ranges from 50 to 500 metric tonnes. With low levels of yield and production and heavy subsistence orientation of agriculture in the district, agricultural markets are not well developed. The lack of agricultural development is evident from the fact that in the entire district there is only one Mandi which is located in Rajgarh tehsil.

CHAPTER V

Animal Husbandry

Animal husbandry, apparently, has good scope for development in the district, in so far as large area of waste and uncultivated land after possibility of their use and the district has a large livestock as pastures population. The district stands eleventh in position in terms of livestock population among the various districts of Rajasthan. According to the livestock census of 1977, the district had a population of 1574522 heads. The largest livestock population in the district was in Sujangarh tehsil claiming 21 per cent of the State's livestock population and smallest was in Taranagar tehsil (8.90 per cent). Poultry farming appears to be a less popular activity in the district as indicated by a negligible poultry population.

Among the existing livestock in the district, the female cattles and female buffaloes are quite important and most of the households keep atleast one of either type. The animals produce milk which is used primarily for domestic consumption and partially for sale in the market. The male cattles and male buffaloes are used for cultivation of land and sometime for transportation purposes. In the district the majority is of female cattles and female buffaloes. The highest proportion of female cattles (22.32 per cent) and female buffaloes (22.91 per cent) are found in Sardarshahr tehsil while lowest percentage of 10.00 per cent female cattles is found in

Ratangarh tehsil and 8.58 per cent female buffaloes are found in Churu. On the other hand, tehsil Sujangarh dominates the category of male cattles and male buffaloes accounting for 45.00 and 34.40 per cent while tehsil Taranagar has the lowest percentage of 1.87 male cattles and 2.11 per cent male buffaloes.

Sardarshahr being a rich tehsil in term of milch cattles population compared to other tehsils, the production of milk products there is much higher than the other tehsils. There are sufficient co-operative dairy centres as well as marketing centres within the tehsil where the sale of milk product is effected at reasonably remunerative prices.

The other animals viz. goats and sheeps are also important and are in sizeable numbers in all the tehsils of the district. These animals give milk as well as raw wool to the people. Both local as well as better breeds of goats and sheep are found in Churu. Those that are of better quality give on an average one kg. to 2.5 kgs. milk at a time and 2 kgs. wool within six months. The milk is generally consumed by households while raw wool is used by households as well as sold for exchange in the market. As per 1977 livestock Census there were 602643 Goats and 456952 Sheeps in the district. Among all the tehsils, 23.30 per cent of total sheep are found in tehsil Sujangarh while the lowest percentage of 5.10 per cent were in tehsil Taranagar. Similarly, the highest proportion of 22.79 per cent of goats is accounted for again in Sujangarh and lowest

proportion of 9.84 per cent in the tehsil Dungargarh. Goats and sheep breed more easily where grazing land with leafy bushes is available in higher proportion than in areas (tehsils) where sufficient grazing land and pastures are lacking.

Since the potential for breeding goats and sheep is relatively more in the district, emphasis is being given to the development of better quality of breeds and their adequate distribution among those who are eligible under various development programmes running in the rural areas. Between 1977-81 around 1889 households have benefited from various animal husbandry schemes listed under the Integrated Rural Development Programmes. The beneficiary households have received milch cattle, sheep and goats or camels in accordance to their preferences. Over 85 per cent households have, however, opted for either sheep or goat units. Thus increasing attention is being given to sheep and goat breeding. Through these programme the beneficiaries are able to enhance their level of living since higher income is generated through these animal husbandry schemes incorporated on the Integrated Rural Development Programme.

Animals like Horses, Mules, Donkey and Ponies are also found though in smaller number, in the district. These animals are used mainly for transportation purposes in the area. According to the livestock Census 1977 there were 4595 Donkey and Ponies and 326 Horses and Mules in the district.

Camel is obviously quite popular in the district as in the State as a whole. The population of camels in the district was 96063 in 1977 as per livestock Census. The animal is used for cultivating the land as well as for transportation purposes. The highest percentage of 21.45 per cent camels were in Sardarshahr tehsil while Churu ranks last with only 11.65 per cent camels among the all tehsils.

Veterinary Facilities

There are very few veterinary hospitals and dispensaries in the district although the district has a fairly large number of animals in various tehsils. The district has 15 veterinary hospitals, 2 dispensaries and one mobile veterinary hospital. Of these veterinary hospitals there are three in each of the tehsils of Sujangarh, Rajgarh and Ratangarh and two in each of the tehsils of Sardarshahr and Dungargarh while the two remaining tehsils namely Churu and Taranagar have one each. Of the dispensaries, one is located in each of the tehsil of Taranagar and Dungargarh while tehsil Churu has a mobile veterinary hospital.

Dairy Development Programme

Observing the potentials of dairy in the district various types of incentives have been offered for dairy development from time to time. During 1977-78, 39 Dairy Development Societies were established and 280 members were registered

Table 5.0 : Tehsilwise Distribution of Livestock in 1977

Category of Livestock and Poultry	Churu		Sardar shahr	Ratan garh	Sujan garh	Dungar garh	Rajgarh	Tara Nagar	Total
	2	3	4	5	6	7	8	9	
<u>Cattles</u>	27668 (10.12)	60696 (22.21)	27194 (9.95)	42544 (15.57)	42033 (15.38)	45505 (16.65)	27644 (10.12)	273284 (100.00)	
Male more than 3 years	408 (5.67)	612 (8.46)	703 (9.72)	3254 (45.00)	1882 (26.03)	237 (3.28)	135 (1.87)	7231 (100.00)	
Female more than 3 years	13943 (80.06)	30928 (22.32)	13853 (10.00)	20929 (15.11)	21238 (15.33)	23193 (16.74)	14460 (10.44)	138544 (100.00)	
Male & Female less than 3 years	13317 (10.44)	29156 (22.87)	12638 (9.91)	18361 (14.40)	18913 (14.83)	22075 (17.31)	13049 (10.23)	127509 (100.00)	
<u>Buffaloes</u>	12316 (8.77)	31354 (22.32)	13964 (9.94)	17771 (12.64)	25229 (17.96)	28113 (20.01)	11715 (8.34)	140462 (100.00)	
Male more than 3 years	316 (6.87)	619 (13.46)	993 (21.59)	1582 (34.40)	629 (13.68)	363 (7.89)	97 (2.11)	4599 (100.00)	
Female more than 3 years	6113 (8.58)	16323 (22.91)	1972 (9.79)	8539 (11.99)	13750 (19.30)	13362 (18.76)	6182 (8.68)	71241 (100.00)	
Male & female less than 3 years	5887 (9.11)	14412 (22.30)	5999 (9.28)	7650 (11.84)	10850 (16.79)	14388 (22.26)	5436 (8.41)	64622 (100.00)	
<u>Sheeps</u>	39543 (8.65)	90430 (19.79)	72052 (15.77)	106469 (23.30)	80042 (17.52)	45116 (9.87)	23300 (5.10)	456952 (100.00)	
<u>Goats</u>	87160 (14.46)	84094 (13.95)	87825 (14.57)	137335 (22.79)	59323 (9.85)	84178 (13.97)	62728 (10.41)	620643 (100.00)	
<u>Horses & Mules</u>	86 (26.38)	15 (4.60)	70 (21.47)	86 (26.38)	40 (12.27)	24 (7.36)	5 (1.53)	326 (100.00)	

Continued.../-

1	2	3	4	5	6	7	8	9
Donkey & Ponys	657 (4.30)	1031 (22.44)	574 (12.49)	702 (15.28)	748 (16.28)	407 (8.86)	476 (10.36)	4595 (100.00)
Camels	11187 (11.65)	20608 (21.45)	8912 (9.28)	11298 (11.76)	10997 (11.45)	18902 (19.68)	14159 (14.74)	96063 (100.00)
Pigs	2 (1.02)	-	-	59 (29.95)	18 (9.14)	-	118 (59.90)	197 (100.00)
Total Livestock	178619 (11.34)	288228 (18.31)	210591 (13.57)	316264 (20.09)	218430 (13.87)	222245 (14.12)	140145 (8.90)	1574522 (100.00)
Poultry	1042 (23.61)	472 (10.69)	356 (8.07)	238 (5.39)	153 (3.47)	1743 (39.49)	410 (9.29)	4414 (100.00)
Total Poultry and Livestocks	179661 (11.38)	288700 (18.28)	210947 (13.36)	316502 (20.05)	218583 (13.84)	223988 (14.19)	140555 (8.90)	1578936 (100.00)

(Bracketed are percentages to total of livestock and poultry)

Source : Source Livestock Census, 1977.

under the respective societies. At the same time Rs.7.27 lakhs, including 5.38 lakhs as subsidy and Rs.1.89 lakhs as loan was distributed among the milk producers to purchase better breeds of milch cattles and 11353 litres milk was collected. Alongwith the financial assistances 627 qtls. of grain was distributed for the milch cattles and 231 milch cattles were purchased for distribution.

Sheep Development Programme

At different periods of time attention had been given to the development of sheep in the area through various schemes. During '1978-79 in the various tehsils the grazing land was selected and utilised for growing the better quality of fodders, establishment of huts for sheeps and sheep owners, and other development like the construction of water ponds in different parts. Consequently 4 sheep wool societies with 208 members were established to promote the exchange systems in the area. Under the programme 7.74 lack sheep were distributed.

Table 5.1

Veterinary Facilities in the Various Tehsils in 1979-80

Tehsils	Veterinary Dispensary Hospitals		Mobile Veterinary Hospitals	Castrated Animals	Bullocks Distributed
Churu	1 (6.67)	<u>6</u>	1 (100.00)	1358 (14.31)	
Sardarshahr	2 (13.33)	-	-	2500 (26.34)	11 (64.70)
Sujangarh	3 (20.00)	-	-	568 (5.98)	
Rajgarh	3 (20.00)	-	-	2143 (22.58)	3 (17.65)
Dungargarh	2 (13.33)	1 (50.00)	-	1553 (16.36)	3 (17.65)
Taranagar	1 (6.67)	1 (50.00)	-	196 (2.06)	
Ratangarh	3 (20.00)	-	-	1175 (12.38)	
District Total	15 (100.00)	2 (100.00)	1 (100.00)	9493 (100.00)	17 (100.00)

Source : Directorate of Economics and Statistics, Rajasthan.

CHAPTER VI

Industry

The scope of industries in the district is very limited because the district ^{is} situated in the desert region. It is reported that earlier there were some traditional industries of handicrafts such as dari, tawels, woolen, blankets, dhabla (woolen petticoat) and earthen pots such as water pots, jugs, jars, cups saucers, iron fans and water tanks.

Currently no large scale industry is found within the district while small scale industries have started coming into existence recently as a result of intensive efforts made under the Rural Industrialisation Schemes undertaken in the various five year plans.

Reviewing the data of the two period of time (1971 and 1980) we observe that the total number of industries of different types have had fluctuations in their growth. The industries producing wool and cotton products have decreased and industries producing wooden articles and units engaged in painting works have died out while eight new industries producing and repairing different products have entered the market during the period between 1971 to 1980.

In 1980 there were 69 industrial units in the district while in 1971 the number was 42 only. Among the existing units in the district about 61 per cent units are engaged in

the processing and production of foodgrain products like flour and oils representing around 45 per cent and 16 per cent of the total units respectively in 1980. The trend of the establishment of oil mills is increasing very fast with a four fold increase in units by 1980 over 1971. Flour mills have also increased by 63.16 per cent over the same period. The possible reason for the increase of these units is that food products are constantly in demand and this demand is ever increasing with increases in the population.

In the urban areas of the district there are 13 printing presses whose chances for expansion seen to be rather limited; for, in a period of ten years only one new unit was established. The other remaining industries taken together account for a very small proportion in the district except for Gum producing industries which account for 7.25 per cent of the total existing units in the district. All the existing Gum manufacturing industries were installed between 1971 and 1980. There was not such mill before 1971. The raw materials for manufacturing the Gum is available within the district and is produced as a crop on the farm. Gum is extracted from Guwar and has various other uses as well.

There were two woolen and cotton industries in 1971 while at present only one unit is functioning. The raw materials used for woolen and cotton industries is also available locally. The closure of the second woolen unit was caused by the non-availability of sufficient raw materials. Among

the other industries existing in the district are roadways workshop, nut and bolts industries, metal works, and some rolling and boring units.

Rural Industries

Rural industries play an important role in the district by offering avenues of employment to the rural workforce and also helps to a certain extent to curtail disguised unemployment in agriculture. Moreover, the locally available raw materials are utilised in these units and at the same time the processed goods are made available to the local people at reasonable prices. Though these rural industries the income levels of the people are raised which adds to their general welfare.

Table 6.0

Registered Factories in the district in 1971 and 1980

Sl. No.	Category of Industry	No. of Units in 1971	No. of Units in 1980
1.	Oil Mills	2 (4.76)	11 (15.94)
2.	Floor Mills	19 (45.24)	31 (44.93)
3.	Printing Press	12 (28.57)	13 (18.84)
4.	Elec. Power House	2 (4.76)	2 (2.90)
5.	Wool & Cotton Mills	2 (4.76)	1 (1.45)
6.	Painting & Others	1 (2.38)	-
7.	Wooden Products	2 (4.76)	-
8.	Rolling and Barring	1 (2.38)	2 (2.90)
9.	Nuts and Bolts	1 (2.38)	1 (1.45)
10.	Roadways Workshop	-	2 (2.90)
11.	Gum Products	-	5 (7.25)
12.	Metal Products	-	1 (1.45)
	Total Number of Units	42 (100.00)	69 (100.00)

Source : Directorate of Economics and Statistics, Jaipur, Rajasthan.

The existing rural industries in the district are primarily based on rural raw materials except the material uses by blacksmiths and the goldsmiths. In the different part of district, 2331 persons are engaged in the various rural industries either as full time or part time workers and generate an annual income of 45.5 lakhs annually. The non-edible oil industry is quite important and common in the district which generates highest proportion of income and engages a majority of labour force as compared to the other rural industries. The industry occupies family labour force accounting 15.37 per cent on full time basis and 75.04 per cent on a part time basis of the total manpower engaged in all rural industries. The per worker productivity of labour engaged on this activity is Rs.1212 and contributes 45.50 per cent of the total income derived from the rural industries of Churu.

Measures have been taken to develop the rural industries under various rural development programmes in particular through the Integrated Rural Development and TRYSEM programmes. In the first stage in 1980-81, about 135 rural artisans were granted financial assistance on a subsidy basis. Further 350 rural artisans (50 artisans per block) were also proposed to be benefitted through Khadi and Village Industries Board and another 175 rural artisan through the District Industries Centres (25 households from each block). Simultaneously 560 rural youths are being trained under the TRYSEM Scheme and

Table 6.1

Rural Industries in 1979-80

Category of Industries	Production (Rs. in lakhs)	Sale (Rs. in lakhs)	Employment			Per Workers Productivity (in Rs.)
			Full time	Part time	Total	
Bamboo Making	0.05 (0.13)	0.10 (0.22)	6 (1.01)	3 (0.17)	9 (0.39)	555.56
Limestone	4.75 (12.77)	6.60 (14.51)	89 (15.03)	105 (6.04)	194 (8.32)	2448.45
Blacksmithy & Goldsmithy	1.22 (3.28)	2.00 (4.40)	36 (6.08)	31 (1.78)	67 (2.87)	1820.90
Cotton Industries	0.05 (0.13)	0.10 (0.22)	65 (10.98)	60 (3.45)	125 (5.36)	40.00
Pot Making	1.11 (2.98)	1.54 (3.38)	31 (5.24)	32 (1.84)	63 (2.70)	1761.90
Oil Processing	2.96 (7.60)	3.28 (7.21)	96 (16.22)	25 (1.44)	121 (5.19)	2446.28
Non-food Oil Processing	16.92 (45.50)	20.01 (43.98)	91 (15.37)	1305 (75.04)	1396 (59.89)	1212.03
Leather Industries	6.78 (18.33)	8.23 (18.09)	138 (23.31)	163 (9.37)	301 (12.91)	2252.49
Food Processing	3.35 (9.01)	3.64 (8.00)	40 (6.76)	15 (0.86)	55 (2.36)	6090.91
Total Number of Industries	37.19 (100.00)	45.50 (100.00)	592 (100.00)	1739 (100.00)	2331 (100.00)	1595.45

Source : Statistical Handbook, Churu, Directorate of Economics and Statistics, Rajasthan, Jaipur.

it is hoped that they will ultimately be able to set up their own small units once their training is over.

Problems and Prospects of Industrial Development

As indicated earlier the district has very few small and rural industries. Industries development in the area has not been satisfactory for a variety of reasons. Being a drought prone area, the agro-based industries are faced with hazards such as non availability of sufficient raw materials. As has been seen that the gum industry units are growing fast and are mainly dependent on raw material availability within the district, efforts to improve the quality of gum should be made. At the same time area under it should be increased if the requirements of the local gum producing industries is to be adequately met. Similarly woolen industry also has a potential for development as the number of better breeds of sheep and goats have been increasing in all the tehsils. There is a need for a better utilisation of raw wool through the use of improved technology. If these steps are taken up there is a possibility that the condition of the rural industries improving and this will be a big help in the overall development of the rural economy of Churu.

CHAPTER VII

INFRASTRUCTURE AND SOCIAL SERVICES

Electricity

Churu, before the advent of the Bhakra Hydel Power, had only one power house which was located in the tehsil of Ratangarh. The capacity of the power house was very low and was supplying the power to the limited areas of tehsil, Ratangarh, Sujangarh, Sardarshahr, and Churu upto 1960, when it was badly damaged and had to be closed down. Since then, however, the electric power to the district was made available through the Bhakra Hydel System and it continues to be the main source of power supply to date.

Churu has a substation in Rajgarh tehsil. The original capacity of the power house was 300 M.W. as recorded in 1971. This capacity has not been increased over the years. Looking at the rural electrification we find that the number of electrified villages have increased from 97 in 1971 to 236 in 1981. Thus the percentage of electrified villages had gone up from 11.41 per cent to 27.76 per cent. All the eleven towns were electrified even before 1971.

The total electricity consumption in the district on different uses was 26.043 million kwh. in 1979-80 while in 1970-71 it was 16.410 million kwh. The electricity consumption has increased by 58.70 per cent in 1979-80 as compared

Table 7.1

Status of Electrification in 1971 & 1981

Sl. No.	Particulars	1971	1981
1.	Total Number of Villages (1971 Census)	850 (100.00)	850 (100.00)
2.	Total Number of Towns	11	11
3.	Electrified Villages	97 (11.41)	236 (27.76)
4.	Electrified Towns	11	11

to 1970-71. In both the years the highest consumption of electricity was found in industrial sector where it accounted for 28.98 per cent and 29.95 per cent respectively of the total consumption. Out of the electricity used by the industrial sector the small scale industries are the main consumers of electricity in both the years. In the agricultural sector the electricity is being used for lifting water and for irrigation and its consumption was 16.90 per cent and 10.76 per cent of total electricity consumption in 1970-71 and 1979-80 respectively. The share of households for their domestic uses was 15.69 per cent and 20.88 per cent in both the years respectively. The share of public utilities like, public water works, in power consumption in 1970-71 was 23.42 per cent while in 1979-80 it stood at 22.98 per cent.

The per capita consumption of electricity in 1970-71 was 18.77 KWh while in 1979-80 the amount is 21.10 KWh. During this period the per capita consumption of electricity has increased by 17.55 per cent.

Table 7.2

Electricity Consumption in Different Uses in 1970 & 1979-80

(in Million Kwh)

Sl. No.	Items of Consumption	1970-71	1979-80	+ Variance
1.	Domestic Consumption	2.575 (15.69)	5.439 (20.88)	+111.22
	i. Light and Fan	2.478 (15.10)	5.239 (20.12)	+111.42
	ii. Heat and Power	0.097 (0.59)	0.200 (0.77)	+106.19
2.	Commercial Consumption	1.997 (12.17)	2.144 (8.23)	+ 7.36
	i. Light and Fan	1.616 (9.85)	-	
	ii. Heat & Power	0.381 (2.32)	2.144 (8.23)	
3.	Industrial	4.757 (28.98)	7.801 (29.95)	+ 63.99
	i. Small & Medium	4.556 (27.76)	5.502 (21.13)	+ 20.76
	ii. Large	0.201 (1.22)	2.299 (8.83)	+103.78
4.	Street Light	0.464 (2.83)	0.728 (2.80)	+ 56.90
5.	Irrigation	2.774 (16.90)	2.801 (10.76)	+ 0.97
6.	Public Water Works	3.843 (23.42)	5.984 (22.98)	+ 55.71
7.	Other (Mixed Load)	-	1.146	+100.00
	Total	16.410 (100.00)	26.043 (100.00)	+ 58.70

(Bracketed figures are percentages to column totals)

Source : Statistic Handbook, District Churu, Rajasthan.

Roads

In Churu, there are four State highways passing through the district. These are Landrum-Pallu Road, Dungargarh-Jumpa Nokha-Salasar and Rajgarh-Pillani. The total length of State highways passing through the district as on 1979-80 was 454 km. while the total length of all other category of roads was 1360 kms. Out of the total only 84 kms. is metalled, 867 kms is painted, 210 kms of cemented and concreated roads and 87 kms is gravelled. In 1970-71 the total length of road was 876 kms. of which 275 kms. was metalled, 397 kms. was painted and 91 kms were fair weather dressed up roads.

Table 7.3

Distribution of Road by Under Different Category in 1970-71 & 1979-80

Sl. No.	Category of Road	1970-71	1979-80
1.	National Highway	113	112
2.	Cemented and Concreated	-	210
3.	Painted Road	397	867
4.	Metalled Road	275	84
5.	Gravelled Road	-	87
6.	Fair Weather Dressed Up	91	-
Total Length of Road		876	1360

Source : District Statistic Handbook, Churu, Rajasthan, 1973 & 1982.

On an areas basis the road length in Churu district works out to 8.2 kms per 100 sq.kms. of the geographical area as against 11 kms. per 100 sq. kms. of the geographical area of the State. Computing the same on population basis, it works out to 849 person per kms. length of road.

The length of National Highway in the district was 112 kms. The other roads passing through the district have a total length of 571 kms. These roads are either metalled or gravelled and are maintained by State Public Works Departments. The road net work has not extended sufficiently so as to link the villages and it is found that very few villages are linked with the roads or railways. According to the Census of 1971 there were only 15.17 per cent villages linked with the Pucca Roads and 14.24 per cent villages linked with Kachcha Roads while 70.82 per cent of villages were not directly linked with roads. The development of roads is found to be very poor in Rajgarh tehsil which has highest number of villages and very few of these villages have road facilities. In tehsil Sardarshahr the highest number of villages are linked with roads. Taranagar tehsil has the lowest number of villages and 32.10 per cent of them are linked with either Pucca or Kachcha Road while in the tehsil Rajgarh the percentage is very low in comparison to the number of villages. It is found that the only 16.12 per cent of total villages are linked by pucca roads. The highest percentage of the villages of tehsil Rajgarh are connected with Pucca Road while the lowest percentage is in the tehsil of Churu among all tehsils.

Table 7.4

Distribution of Villages According to the Source of Road Communication in 1971

Tehsil/ District	Pucca Road	Kachcha Road	Total Villages with road co- mmunica- tion	Village without road co- mmunica- tion	Total no. of Villages
Taranagar	11 (12.64)	17 (19.54)	28 (32.18)	59 (67.82)	87 (100.00)
Rajgarh	23 (12.50)	17 (9.24)	40 (21.74)	144 (78.26)	184 (100.00)
Sardarshahr	30 (18.52)	35 (21.60)	65 (40.12)	97 (59.88)	162 (100.00)
Churu	11 (12.35)	10 (11.23)	21 (23.60)	68 (76.40)	89 (100.00)
Dungargarh	15 (16.67)	12 (13.33)	27 (30.00)	63 (70.00)	90 (100.00)
Ratangarh	19 (20.88)	11 (12.09)	30 (32.97)	61 (67.03)	91 (100.00)
Sujargarh	28 (19.05)	19 (12.93)	47 (31.97)	110 (74.83)	147 (100.00)
Total	137 (16.12)	121 (14.24)	258 (30.35)	602 (70.82)	850 (100.00)

Source : District Census Handbook, Churu, Rajasthan.

Not only does the district suffer from the problem of inadequate development of its roads but its railway network is also insufficient in comparison to the needs of the people. This is reflected in the fact that out of the total villages

of the district only 22 villages are directly or indirectly linked by rail. Rajgarh tehsil appears to have the best railway links since the maximum number of these 22 villages fall in the tehsil. Two villages of Dungargarh have rail links while no villages in either Taranagar or Sujargarh have rail links. The district is served by the western and the northern railways. The total length of railway track in the district is 316 kms.

Co-operative Societies

In the rural areas, or for that matter even in urban centres, cooperative societies can play and have in fact been playing a vital role in the promotion of agricultural as well as non-agricultural activities. They supply credit at reasonable rates of interest, ensure adequate and timely supply of good quality raw materials and also undertake the responsibility of marketing the finished products. The role of different societies may differ but the basic objective is to ensure that its members become collective beneficiaries in the activity that the cooperative society is promoting. There are 608 various categories of such societies functioning in Churu. They facilitate and administer guidelines for production and distribute the finances by way of loans as well as assistances. During the period 1980 the working capital of all societies was Rs.1460.59 lakhs and the liabilities was Rs.1408.60 lakhs. They had a total membership of 116654 and Rs.683.89 lakhs was advanced as loan through these societies.

The strength of cooperative societies seen by way of membership is positively related with the level of participation of the people in the district in that activity. Thus agricultural credit societies are in relatively large numbers as compared to any other society because a majority of households are primarily dependent on the agricultural sector. There are 176 such cooperative societies with 74.14 per cent members to total members in all societies. During 1980, these societies have advanced Rs.296.68 lakhs as loan and recovered Rs.132.66 lakhs at the end of the year. The societies, have a total liability of Rs.582.06 lakhs and operate with a working capital of Rs.602.68 lakhs. In term of the members had Land Development Bank turns out to be the second most important cooperative institution. With Rs.163.98 lakhs as working capital and Rs.153.76 lakhs as liabilities, the society has distributed Rs.52.19 lakhs as loan for developing and improving the land sites to the farmers. The societies formed for the development of animal husbandry sector are also found in sizeable numbers. There are 67 milk collection and supply societies in the different areas of the district. They collect the surplus milk from the villagers and supply milk in other scarcity areas. The societies have 3690 members with Rs.3.57 lakhs working capital and Rs.2.21 lakhs as liabilities. Sheep breeding centres are also quite sizeable in numbers(59) and have 1542 members. They have a total working capital of Rs.0.98 lakhs. Members obtain better quality sheep through these societies.

Thus societies helping in agricultural activities and in the animal husbandry sector are the most important types of cooperatives in operation in Churu constituting around 50 per cent of the total cooperative societies and account for over 80 per cent of the total membership.

To promote industries in the area, 60 industrial societies and 13 weaving and spinning societies has been established with a working capital of Rs.18.33 lakhs and Rs.0.83 lakhs respectively. The liabilities of industrial societies is Rs.18.40 lakhs and Rs.0.74 lakhs is of weaving and spinning societies. But no loan have been distributed by them so far. Among other categories of cooperative societies, the housing societies are significant in numbers (66) and members(2064), with an aggregate of Rs.27.41 lakhs as their working capital and Rs.27.39 lakhs as liabilities. The purpose of these societies is to disburse loans for house construction for the economically and socially backward classes. During 1980 these societies had distributed Rs.0.86 lakhs as loan while only Rs.0.03 lakhs was recovered.

Education

As stated earlier Rajasthan itself is among the backward states from the point of view of education with an overall literacy rate of 24.05 per cent as against the All-India average of 36.17 per cent. In Churu district literacy rate is still lower at 21.62 per cent: 14.34 per cent in the rural areas and

Table 7.5

Development of Cooperative Societies in the District in 1980

(in lakh rs.)

Category of Societies	No. of Societies	Members	Loans advanced	Loans recovered	Loans outstanding	Liabilities	Working Capital
Central Cooperative Bank	1 (0.16)	271 (0.23)	324.91 (47.51)	248.62 (62.80)	474.72 (47.69)	581.77 (41.30)	598.42 (40.15)
Primary Land Development Bank	1 (0.16)	4541 (3.89)	52.19 (7.63)	12.18 (3.08)	12.98 (1.30)	152.76 (10.84)	163.98 (11.23)
Agricultural Credit Soc.	176 (28.95)	86485 (74.14)	296.68 (43.38)	132.66 (33.51)	466.68 (46.88)	582.06 (41.32)	602.68 (41.26)
Non-Agrl. Credit Soc.	29 (4.77)	2515 (2.16)	-	0.23 (0.06)	6.48 (0.65)	12.20 (0.87)	14.04 (0.96)
Marketing Societies	5 (0.82)	1426 (1.22)	9.22 (1.35)	2.17 (0.55)	9.65 (0.97)	15.09 (1.07)	16.68 (1.14)
Milk Supply Centre	67 (11.02)	3690 (3.16)	0.03 (0.01)	-	0.03 (Neg.)	2.21 (0.16)	3.57 (0.24)
Poultry Societies	2 (0.33)	34 (0.03)	-	-	-	0.03 (Neg.)	0.02 (Neg.)
Sheep Breeding Centre	59 (9.70)	1542 (1.32)	-	-	0.18 (0.02)	0.86 (0.06)	0.98 (0.07)
Wholesale Stores	1 (0.16)	4127 (3.54)	-	-	-	12.34 (0.88)	14.60 (1.00)
Primary Consumers Stores	18 (2.96)	3880 (3.33)	-	-	-	0.63 (0.04)	0.84 (0.06)
Housing Societies	66 (10.86)	2064 (1.77)	0.86 (0.13)	0.03 (0.01)	24.69 (2.48)	27.39 (1.94)	27.41 (1.88)
Weaving & Spinning Industrial Societies	13 (2.14)	360 (0.31)	-	-	-	0.74 (0.05)	0.83 (0.06)
Labour Centre	60 (9.87)	1313 (1.13)	-	-	-	18.40 (1.31)	18.33 (1.25)
Transport Societies	32 (5.26)	673 (0.58)	-	-	0.01	2.02 (0.14)	2.95 (0.20)
Non-Agl., Non-Credit Super Union	3 (0.49)	62 (0.05)	-	-	0.08 (0.01)	0.06 (0.01)	0.10 (0.01)
District Institution	3 (0.49)	205 (0.18)	-	-	-	0.04 (Neg.)	0.03 (Neg.)
Societies under Liquidation	1 (0.16)	281 (0.24)	-	-	-	-	-
	71 (11.68)	3185 (2.73)	-	-	-	-	9.07 (0.48)
Total	608 (100.00)	116654 (100.00)	683.89 (100.00)	395.89 (100.00)	995.50 (100.00)	1408.60 (100.00)	1460.59 (100.00)

(Bracketed Figures are percentage to totals of each column)

Source : Office of the Registrar Co-operative.

39.16 per cent in urban areas as registered in the 1981 Census. The level of literacy among females is shockingly low (.3.22 per cent) particularly in the rural areas.

Table 7.6

Number of Educational Institutions in Churu (1979-80)

	Primary Schools	Junior High Schools	Secondary & Higher Secondary Schools	Colleges	Occupational Special Training Colleges	Professional and Other Schools	Total Institution
Rural	552	146	39	-	-	-	737
Urban	134	41	38	5	5	2	225
Total	686	187	77	5	5	2	962

The above table shows the distribution of various educational institutions in Churu for 1979-80. In terms of network of schools and colleges, Churu does not seem to be particularly ill served. For a total of 850 villages, there are 552 primary, 146 Junior High Schools and 39 Higher Secondary Schools. But in view of the sparse distribution of population it is likely that quite a few areas are still not served by a school in accessible distance. In 11 towns on the other hand there are 134 primary schools, 41 junior high schools, 38 higher secondary schools, 5 occupational and special training colleges and another 5 colleges for general education and lastly 2 professional

and other schools. All institutions in the last three categories are of course, located in urban areas only.

Table 7.7

Enrolment by Sex and Area (1979-80)

	Primary Schools	Junior High School	Higher Secondary & Secondary Schools	Colleges for General Education	Occupational & Special Training Colleges	Professional & Other Schools	Total
<u>Rural</u>							
Boys	31657	19462	6436	-	--	-	57555
Girls	6199	2939	269	-	-	-	9407
Total	37856	22401	6705	-	-	-	66962
<u>Urban</u>							
Boys	14992	9252	11819	2967	516	67	39613
Girls	6219	4551	4548	208	52	9	15587
Total	21211	13803	16367	3175	568	76	55200
<u>Total</u>							
Boys	46649	28714	18255	2967	516	67	97168
Girls	12418	7490	4817	208	52	9	24994
Total	59067	36204	23072	3175	568	76	122162

In the overall picture we find that enrolment of the boys is much higher than that of females. Out of the total enrolment in the primary schools boys account for 78.98. This percentage

is higher still (83.62 per cent) in the rural areas. As we move from primary to the higher secondary level in the rural areas the enrolment percentage of females to total enrolment drops down to around 4. Although data relating to drop out rates as such are not available yet if we take the enrolment numbers at the primary, junior high school and higher secondary levels as a proxy to the drop out we can say that the drop out rate is quite high among both boys and girls whereas in the case of girls is much higher. This shows that a majority of the girls discontinue their education after the primary level. The main reason could be the almost full time participation of females in domestic, agriculture and allied activities and early marriage among girls in the rural areas after which education is stopped. A relatively better picture, however, emerges in the case of the urban areas.

Medical & Health

Among the social infrastructure facilities like education, health too is an important aspect being looked into by both the centre and the State. If the best is to be brought out from an individual it is essential that the person concerned should enjoy a sound health. On account of improper drinking water facilities is particular the people of Churu are persistently troubled by diseases such as T.B. and stone of the kidney and gall bladder.

Table 7.8

Medical and Health Facilities in Churu 1979-80

Rural/ Urban	Hospitals	Dispensaries	Primary Health Centres	Child & Mother Welfare Centres	Family Welfare Centres	Govt. & Ayurvedic Dispensa- ries	T.B. Hospitals	Total	Population
Rural	-	24 (2.89)	7 (0.84)	-	7 (1.08)	81 (9.75)	-	119 (14.56)	8.31
Urban	8 (2.32)	6 (1.74)	-	6 (1.74)	12 (3.48)	6 (1.74)	2 1 (0.58)	41 (11.88)	3.45
Total	(8 (0.68)	30 (2.55)	7 (0.60)	6 (0.51)	19 (1.79)	87 (7.39)	2 1 (0.17)	160 (0.09)	11.76

Source : District Statistical Handbook, Churu, Rajasthan.

P.S. : Figures in brackets shows the type of facility available per lakh of population.

The district has a total of eight allopathic hospitals all of which are situated in the urban areas. There are 30 dispensaries of which 80 per cent are in the rural areas. Each block of the district has a primary health centre which again is in the rural areas. As was the case with hospitals all the six child and maternity welfare centres of the district are located in urban areas. Besides there are two government Ayurvedic hospitals and a hospital for T.B. patients and these two are confined to the urban areas. The rural areas have one family welfare centre per block and over 90 per cent of the total (87)

Unani and Ayurvedic hospitals of the district. In all therefore there are 160 allopathic or other hospitals, dispensaries and health centres in Churu. It is obvious from table 14 that the rural areas lack in advanced medical facilities and for the treatment of chronic diseases the people have to be rushed to the nearest urban centre. The dispensaries and primary health centres are not sufficiently equipped to cater to all the needs of the people.

Looking at the medical facilities at the tehsil level we find that there are on an average 3 allopathic dispensaries per tehsil with Rajgarh having a maximum of 5 while Ratangarh has only 2. The average number of persons dependent on these dispensaries is around 35 thousand with Rajgarh (19 thousand) being the best off while in Sujangarh there are as many as 58 thousand persons per dispensary. Likewise each tehsil has around 10 Unani or Ayurvedic dispensaries with Sardarshahr having the maximum (14) and Ratangarh the least (9). They on an average cater to 10 thousand persons with Rajgarh in the best position (7 thousand) and Sujangarh the worst off (16 thousand).

Drinking Water Facilities

The district has a number of sources of drinking water. However, water of some of these sources have various impurities such that water borne diseases are a big hazard to the people of the district. Safe and potable drinking water is available

in 535 villages and all the 11 towns in Churu thereby covering slightly over 60 per cent of the total population. The remaining villages are proposed to be fully covered by 1984-85. The proposal is to provide water through hand-pumps and tanks in villages where the population is up to 1500. In villages where population is below 1000 water supply is to be made through hand-pump schemes.

At present 3 towns have protected water supply and 735 villages depend on wells. Of which 16 are tubewells. A number of villages depend on tanks and other sources. The sources of drinking water is given on a tehsil-wise basis in Table 7.9.

Table 7.9

Source of Drinking Water in the Tehsils of Churu

Tehsil/ District	Tap	Well	Tank	River	Tubewell	Other	Total
Taranagar	-	52	22	-	1	73	148
Rajgarh	-	142	35	1	-	136	314
Sardarshahr	-	156	78	-	1	23	258
Churu	-	85	30	-	6	68	189
Dungargarh	2	82	37	-	4	1	126
Ratangarh	1	80	70	-	2	6	159
Sujargarh	-	114	62	-	2	15	193
District	3	718	334	1	16	322	1395

Source : Census Rajasthan 1971.

The total water consumption of the district is 14.66 mcm annually of which 11.06 mcm. is for domestic purposes while the rest is for irrigation. Maximum availability of water is from the Sikar basin (6.64 mcm/yr.) while the remaining (4.42 mcm/yr.) is made available from Bikaner basin.

CHAPTER VIII

Summary and Conclusion

Churu has a total area of 16862 sq. kms. and a population of 11.76 lakhs (1981 Census). The district has semi-desert type soil conditions with the soil composed of over 90 per cent sand while the rest is clay. The district is characterised by large variations in temperature ranging from around zero degrees centigrade in the winters to 45°C P. during the summers. The average rainfall is around 339.4 mm. of which 85 per cent is received during the monsoon period. While rainfall is inadequate to sustain agriculture it is also rather erratic in nature and is not always received at the time when the crops are in maximum need of it. Added to this is the fact that the district has a highly inadequate irrigation level. Consequently the district has been identified as drought prone.

Taking the 20 years period 1961-80 as many as 15 years are classified as drought years of which 1963, 1965, 1967, 1972, and 1979 have been the years of severe drought. In fact only 1964, 1971 and 1978 were the drought free years and had a good Kharif season. With over 70 per cent of the total population dependent on agriculture the recurrence of drought with such menacing regularity has a rather depressing effect as a result of which neither agricultural development nor the economy of the district in general have been able to get the required

boost. Consequently, the population in general and the rural masses in particular have not had a opportunity to improve their level of living. Taking agricultural production between 1970-71 and 1979-80 we find that the drought years have registered heavy crop losses. The maximum crop loss has been in the year 1979-80 (88 per cent) and to a slightly lesser extent in 1974-75 (73.7 per cent) and 1972-73 (66.7 per cent).

Since the district has no perennial rivers no major or medium irrigation work can be undertaken with the existing water resources of the district. There is heavy loss of surface water through evaporation as well as through seepage in the sandy soil which is porous. The net irrigated area of the district (247 hectares) in 1979-80 was only 0.05 per cent of the net Cultivated area (875151)hectares). Similarly the gross irrigated area (790 hectares) works out to a meagre 0.09 per cent of the gross cropped area. This clearly brings out the inadequacy of irrigation facilities in the district. In fact Churu is among the least irrigated districts of the State. In the absence of any perennial sources, the ground water resources, are the main source of irrigation. However, they too have not been properly assessed to give estimates of their actual potential and their subsequent utilisation. The State Ground Water Board conducted a survey in 1972-73 to measure ground water potential in Churu. Then in 1980 the Central

Ground Water Board also surveyed the ground water potential of the district and finally in 1982 the Special Schemes Organisation, Rajasthan also made a survey in this connection. While the methods adopted by these three different organisations might have been slightly different as is reflected in each organisation having its own figure regarding recharge, draft and surplus, the obvious fact that is brought out very clearly from each study is that the district has a reasonable potential which has not been properly exploited and is reflected in the surplus ground water which ranges from around 180 MCM to 198 MCM according to the different surveys. Provided the sources of ground water can be properly tapped and then effectively utilised a much greater area may be covered under irrigation as compared to the present leading to a substantial increase in agricultural production.

The figures of land use pattern bring out rather vividly the extent to which net area sown is adversely affected as a result of drought. In 1970-71, which was a normal agricultural year, the net area sown (1232674 hectares) was around 73 per cent of the total area. Again in 1978-79, another normal year, the net area sown stood at around 74 per cent. In 1979-80, on the other hand, a year of severe drought, the net area sown came down very sharply (875151 hectares) and was only

around 52 per cent of the total area. This shortfall in net area sown was absorbed by current fallows which subsequently shot up from 6.59 per cent in 1970-71 to 25.51 per cent in 1979-80. Had the irrigation facilities been better developed the impact of drought might have been diluted to a certain extent. The prevalence of drought has not only affected the net area sown but also had adverse effect on the yield per hectare of the various crops. As compared to 1970-71 the crop yields of all crops came down in 1979-80. The sole exception being wheat in whose case there has been an approximate 16 per cent increase in the per hectare yield. Wheat, however, is grown primarily where irrigation is available and so the productivity has not been adversely affected and has in fact gone up even in a year of severe drought. This again draws our attention to the need for the proper utilisation of the surplus ground water resources. If only irrigation facilities can be extended over a larger area the fluctuations in net area sown as well as in the productivity of different crops may be avoided. Moreover the cropping pattern itself may undergo a significant change. A much larger area as compared to at present may be utilised for the cultivation of wheat which not only has a much higher productivity but is also a superior food crop as compared to Bajra which is at present the major food crop in Churu covering around 46.5 per cent of the gross cropped area. Bajra appears as the main crop primarily because

it does not require as much water and as such is the ideal crop for the district. However, over emphasis of this issue might be stretching the point too far for in the absence of proper soil tests it is too early to conclude that wheat can displace Bajra provided adequate irrigation facilities are provided. The soil might not be suitable enough to be able to bring about a radical change in the cropping pattern. However, the agricultural situation, as it exists today, points to the fact that the predominantly agricultural economy of the district is a subsistence economy which does not exhibit any dynamic elements.

Looking at per hectare productivity of different crops in the district we find that as compared to the average productivity of the State, Churu has a lower yield rate in all crops except wheat. But wheat is at present covering a very small area under it and its cultivation is restricted to those areas only where irrigation facilities are available. Bajra, which is the principal crop had a very poor yield in 1979-80 which was a very bad agricultural year. However, the yield in the same year for the state as a whole (although much lower than the other years) was four times higher as compared to Churu.

Although agriculture continues to be the main stay of the masses one feels sceptical about the extent to which it

can be relied upon exclusively from the point of view of raising the levels of living of the masses. With the apprehension in mind one has to think in terms of alternative sectors which should be developed such that people can either supplement their low incomes originating from agriculture or make it their primary activity.

From this angle animal husbandry offers substantial scope. Churu has a sizeable livestock population which stood at 15.74 lakhs in 1977. Between 1971 and 1977 the livestock population increased by about 10.5 per cent. Of these 2.10 lakhs are milch animals (cows and buffaloes above 3 years) and constitute around 13 per cent of the livestock population in 1977. Besides these the district also has a large population of goats (6.03 lakhs) and sheep (4.57 lakhs) accounting for 38.31 and 29.03 per cent of the livestock population. These three categories together form slightly over 80 per cent of Churu's livestock and can play a significant role in improving the standard of living and the income levels of the people. The sale of milk and milk products can be done properly with the help of the cooperative societies. In fact Churu had in 1980 as many as 67 milk supply centres. Cooperatives can be developed and expanded appropriately for general goats and sheep are able to survive even under adverse conditions thus they are of significance in a district like Churu which has a semi-desert type soil and inadequate water resources. Both provide wool while goats are useful also because

their milk is used for human consumption. The State Government has laid emphasis on sheep and goat breeding in Churu. The district had 59 sheep breeding centres in 1980.

Under the existing Integrated Rural Development Programmes there are schemes where in the beneficiaries are being provided these animals under the loan-cum-subsidy schemes. However, simply providing a beneficiary with a better quality buffalo or some specified number of either sheep or goats itself is in-sufficient. These beneficiaries are drawn from those who are living below the poverty line. They are not always in a position to provide sufficient fodder to them. Moreover, in a district like Churu characterised by sandy soils covering over 3/4 of the area pastures and grazing land is less than 3 per cent of the total area. Efforts have therefore to be made to bring a greater area under pastures. The district and block level agencies should also ensure that the beneficiaries get adequate fodder at reasonable prices. Provision should also be made for the marketing of the produce like milk and raw wool. Guwar is an important cattle feed. Efforts can also be made for the marketing of the produce like milk and raw wool. Guwar is an important cattle feed. Efforts can also be made to increase its production.

Among the other natural resources both forests with less than 0.5 per cent area under it and with mineral deposits scattered in small pockets making them commercially non-viable, one can not expect much from either the forest or mineral wealth of the district to support its economic development.

Churu presents a rather poor picture from the point of view of industrial development as well. The district has no large or medium scale industries although small scale units have gained some momentum of late as a result of various efforts made by the State Government. The situation as it stood in 1980 was that there were 69 small scale registered units in the district. Of these 60 per cent units belonged to the food products category. If the State Government takes proper initiative the dairy and dairy products units can be set up as the district has a large number of milch cattle. The milk supply centres can be entrusted the job of collecting surplus milk. They will, of course, have to be provided with proper chilling facilities. They can supply not only milk but also process and supply various milk products.

Yet another resource based industry that needs to be given impetus is the woollen industry. In 1971 there were two such units but by 1980 one unit closed down because of inadequacy of raw material. Here again necessary steps may be taken to ensure that such bottlenecks are removed.

Guwar, besides being an important cattle feed is being used as a primary input in the five gum producing units in Churu. This is a relatively new industry and the authorities should take proper care to ensure that these units expand as far as possible rather than meet the fate of the woollen units.

The small scale units thus offer some scope for development and can come up as potential employment and income generators. However, the government will have to come forward and make concerted efforts for their expansion. The resource based industries shall have to be provided raw materials on time, in-sufficient quantity and at reasonable rates. At the same time infrastructure facilities like power, road transport, financial assistance and technical guidance will have to be provided to the entrepreneurs.

Taking an overall view of the conditions prevalent in the district, one may surprise that water is distinctly a constraint in the economic development since agriculture which has an overwhelming importance in Churu is being impeded in its development by water scarcity. Proper tapping and efficient utilisation of the water resource potential therefore, needs to be given very high priority. This would not only help cultivation but will also enable the development of pastures. But the extent to which even sufficient water supply can give the desired boost to agriculture, also seems limited in view of the nature of soil in the district and an

assessment of this potential can be made only after proper soil surveys are conducted. Animal husbandry and small scale industries particularly those based on wool and guwar, to begin with, offer promises of development. It would, however, be necessary to go beyond these activities into the area of modern small scale industries for fuller development of the district, for which systematic planning and provision of various infrastructure facilities would need to be made.